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ABSTRACT

Computer programs, as legitimate original inventions or creative written expressions, are entitled to patent or copyright protection. Understanding the legal implications of this concept is crucial to both computer programmers and their employers in our increasingly computer-oriented way of life. Basically the copyright or patent procedure involves (1) creativity, (2) an application for copyright registration or patent to the appropriate government office, (3) a notice on the original publication or patented process, and (4) various contractual agreements between the originator and the user of the written idea or invention. Both the creator and the user can lose financially by now adhering to these rules. If the programmer does not protect his procedures others may appropriate them for a profit without compensating him. On the other hand, any industry using a computer program risks infringement of patent or copyright if the program's origin and reservations on use are not carefully screened. The dilemma occurs in the scope of protection. There are advantages and disadvantages to both forms of protection. The law of trade secrets provides some relief. Yet, until revision of copyright and patents laws consistent with the new technology is accomplished, complete protection may not be attained. (Author/SJ)

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PROTECTION OF COMPUTER PROGRAMS -

A DILEMMA

by

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Editorial Review by Captain John B. McTasney, Department of English, United States Air Force Academy.

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ABSTRACT

Computer programs, as legitimate original inventions or creative written expressions, are entitled to patent or copyright protection. Understanding the legal implications of this concept is crucial to both computer programmers and their employers in our increasingly computer-oriented or technological way of life.

Far from restricting initiative and competition in an unrestricted economy, patents and copyrights encourage creative initiative. By protecting the individual's right to compensation for his creative efforts, these concepts spur men to create improvements. English law recognized such just precepts as early as 1559 and established procedures for protecting rights of ownership in inventions and the written form of original ideas. United States jurisprudence has continued the practice.

Basically the copyright or patent procedure involves (1) creativity, (2) an application for copyright registration or patent to the appropriate government office, (3) a notice on the original publication or patented process, and (4) various contractual agreements between the originator and the user of the written idea or invention. Both the creator and the user can lose financially by not adhering to these rules. If the programmer does not protect his procedures, let alone ultimate problem solving programs, others may appropriate them for a profit without compensating the programmer. On the other hand, any industry, private or public, using a computer program risks infringement of patent or copyright if the program's origin and reservations on use are not carefully screened.

The dilemma occurs in the scope of protection. There are advantages and disadvantages to both forms of protection. The law of trade secrets provide some relief. Yet, until revision of copyright and patents laws consistent with the new technology is accomplished, complete protection may not be attained.

TABLE OF CONTENTS

Chapter

Abstract iii

Glossary of Uncommon Terms iv

Preface vii

I. Background of Copyrights and Patents 1

II. Copyrights and Patents Distinguished 29

III. Assignments, Licenses and Magazine Rights 42

IV. The Computer Industry, Patents and Copyrights 52

V. Employer-Employee Relations 64

VI. Copyright and the Programmer 97

VII. Patentability of Computer Programs 113

VIII. Third Generation Protection 133

Appendix

A Form for Registration of Copyrights A-1

B Form of Application for Patent--Specification, Sample Claims Based Upon a Representative Program B-1

C Suggested Confidential Clause for Employment of Non-programmer and a Programmer C-1

D Additional Bibliography D-1

E References E-1

GLOSSARY OF UNCOMMON TERMS

ALGORITHM: Any particular procedure for solving a certain type of problem.

ALPHA-NUMERICS: (Of a set of characters), including both letters and numbers.

ASSIGNEE: The recipient of an assignment.

ASSIGNMENT: A transference of a right, interest or title.

ASSIGNOR: The transferor of a right, interest or title.

ASSIGNS: The act of assignment.

CAVEAT: A warning or caution.

COMMON LAW: The unwritten law of England based upon custom or court decision as distinct from statute law.

DOCTRINE OF INDIVISIBILITY: Theory or concept in copyright law in which ownership is not separable into parts or interests; incapable of being divided.

FLOW CHART: A graphic representation, more detailed than a flow diagram, of a sequence of operations in a computer program.

FRANCHISE: A privilege of a public nature conferred on an individual by a governmental grant.

FREEHOLD INTEREST: A form of tenure by which an estate is held in fee simple.

GRANT: To bestow or confer by a formal act, e. g., to grant a charter.

HARDWARE: Any electronic or mechanical equipment used in association with data processing, i. e., computer.

LETTERS OF PROTECTION: A grant or privilege to trade.

LICENSE: Permission to do or not to do something.

MONOPOLY: An exclusive privilege to carry on a traffic or service granted by a sovereign state.

PRINT OUT: The printed output of a computer usually produced on continuously moving paper.

PROPERTY: Ownership, right of possession, enjoyment or disposal of anything.

SERIAL RIGHTS: The right of a magazine publisher to publish a manuscript in serial form.

SHOP RIGHT: The right of an employer to use an invention of his employee without compensating him for the use in cases where the invention was made at the place of and during the time of employment.

SOFTWARE: Any of the written programs, flow charts, etc., including general subroutines that may be inserted in computer programs.

STATUTORY LAW: The written law established by enactments expressing the will of the legislature.

TIE-IN: Pertaining to or designating a sale in which the buyer in order to get the item desired must also purchase one or more other usually undesired items.

PREFACE

I have found legal documents particularly difficult to read and only now have I discovered why lawyers talk funny. This article, however, is written for those of us who know and work with computers. The legal terms and examples are explained well and are clearly relevant to computerdom.

The conclusions drawn from this article may or may not lead one to press for specific legislation. The alternatives suggested should, however, provide for a great deal of discussion among the professional computer scientists. In any event the fundamental algorithms used to secure some protection are presented to provide a basis for individual problem solving.

For more than a decade the computer industry has flourished in an environment without specific protective legislation. It has been an expensive era of creation and recreation. There has been relatively little published compared with the accomplishments made. With the exception of the past year or so, all that was published easily fit in the realm of protection provided all other published materials. Today some creative, as well as expansive and expensive, computer systems are being written and the programmer, designer or developer needs to know how to protect his specific interests.

Like writers, some who report the news, record history or create short stories or poems and others who devote their lives to novels, computer programmers fall into many categories. Some programmers are completely isolated from the big problem while others are the creators of huge and complex systems. But all programmers, great or small, have a definite need to know how the law affects them and what protection for their creative talents is available.

My association with William H. Carnahan began in an ALGOL programming course for faculty members which I taught at the Air Force Academy. He was an excellent student and very conscientious in his efforts to learn the basic techniques of programming using ALGOL. Subsequent to the course, I accompanied him on several trips to visit computer systems in the area. Notable among these was North American Air Defense Command and LITE (Legal Information Through Electronics). He has learned the language of the computerman although he speaks with a slight lawyer's accent.

This article is a significant contribution to break down the communication barrier between the funny talking lawyers and, to my surprise, the sometimes hard to understand computer people.

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CHAPTER I

BACKGROUND OF COPYRIGHTS AND PATENTS

> The Congress shall have the power. . .
>
> To promote the progress of science and the useful arts
> by securing for limited times to authors and inventors
> the exclusive rights to their writings and discoveries. . .
> to make all laws which shall be necessary and proper
> for carrying into execution the foregoing powers. . .
>
> The Constitution of the United States

The framers of the Constitution laid the foundation for the two forms of protection in the United States. The history of the constitutional convention is not really clear as to why the two forms of protection were lumped together in this way, or why copyrights and patents were not mentioned by name. As a result, there has been a good deal of debate as to the scope and construction of the constitutional language.

The question may be raised as to why the words "patent" and "copyright" were omitted from Article I, Section 8, Clause 8, of the Constitution. Certainly, the framers of the Constitution recognized patents and copyrights as distinct. Yet they considered them so closely related in nature and in purpose that it was perfectly natural to deal with them together. Possibly the following passage from the Federalist, Number 43, will shed some light on the question:

> The utility of this power will scarcely be questioned. The copyright of authors has been solemnly adjudged in Great Britain, to be a right of common law. The right to useful inventions seems with equal reason to belong to the inventors. The public good fully coincides in both cases with the claims of individuals. The States cannot separately make effectual provision for either of the cases, and most of them have anticipated the decision of this point, by laws passed at the instance of Congress.[1]

It has been suggested that the reason the terms patent and copyright were omitted from Art. 1, Section 8, Clause 8, was to broaden the grant and avoid any technical limitations then attached to the terms.

Copyrights

The common law right (evolved from decisions of the courts as distinguished from legislative enactments) of the author to the exclusive ownership of his literary materials was acknowledged in England as early as 1556 by the Charter of Stationers and the decrees of the Star Chamber.[2]

However, when printing from type was invented and literary works could be produced in quantities for circulation, an author had difficulty in obtaining protection from the law when his work got into print.

In 1556, the Stationers' Company, made up of the leading publishers and book sellers of London, was established by royal decree for the primary purpose of checking the spread of the Protestant Reformation by concentrating the whole printing business in the hands of members of that company. Printing was subject to the orders of the Star Chamber so that the Government and the Church could exercise effective censorship and prevent seditious or heretical works from getting into print. It was essentially a means of controlling the press and in nowise afforded protection to the authors. The struggle to achieve freedom of the press has been long and difficult.

Once the invention of the printing press made possible the dissemination of information generally, it became painfully clear to the monarchs of Europe that here lay a really serious threat to their absolute powers. Their first reaction was to outlaw and destroy this new instrument of seditious propaganda. Failing in this, they resorted to a system of licensing under which all publications, before being released to the public, had to be submitted to the King's Licenser. Serious penalties were meted out to those whose publications did not bear the official "imprimatur." Obviously no criticism of the sovereign or government, whether just or unjust, could be published under such a system, and the long fight against the official licenser was a major part of the struggle to establish democratic institutions.

Under the royal decree all published works had to be entered in the register of the Stationers' Company and in the name of some member of that company. By virtue of this entry and supported by the Star Chamber, the stationer successfully claimed the sole right to print and publish for himself, his heirs and assigns forever. In the course of time, and especially after the last of the old Licensing Acts expired in 1695, the ban against unlicensed printing was lifted and independent printers sprung up and invaded the sacred domain of the Stationers' Company. As a result, the company applied to Parliament for a law to protect its so-called perpetual rights against these pirates. The Stationers got much less than they had reckoned for because the British lawmakers, instead of recognizing their perpetual rights, passed an act which limited their exclusive right to publication to a paltry term of years. Its effect was to limit the exclusive rights of the Stationers.

This was the well known Statute of Anne (1710), the first law to specifically recognize the rights of authors as well as the foundation of all subsequent legislation on the subject of copyright both here and abroad.[3]

So far as existing literary works were concerned, the statute provided that the "authors or their assigns" should have the sole right of publication for 21 years, but for new works the right was to run for 14 years, and the author, if living at the end of such term, was granted the privilege of renewal for 14 years more. Suitable penalties were provided for violation of the Act, but conditioned always upon entry of the title of the work in the Register books of the Stationers' Hall as evidence of ownership, and the deposit of copies of the work itself in certain designated libraries of the Kingdom. Somewhat later, as a further protection to the general public so that "none may offend through ignorance of the copyright," the provision for notice of such entry was required to appear on every copy of the published work.

While the statute seemed plain enough, the Stationers nevertheless still contended that their perpetual rights were not taken away but that the purpose of the Act was merely to enable them to obtain speedier relief against piracy, this being the only thing they sought from Parliament in the first place. For more than half a century the English lower courts upheld them in this view by granting many injunctions (order preventing continued future conduct), even after the expiration of the term fixed by statute. However in 1774 the judicial branch of the House of Lords ruled against them, deciding that the author had, under common law, sole perpetual rights only so long as the literary work remained unpublished, but that upon publication the duration of the right could only be for the term fixed by the statute.

The statute expressly sanctioned the importation of books in foreign languages without the recognition of any rights on the part of foreign authors; but it said nothing about importation of English books printed or reprinted abroad. Such a contingency seemed out of the question, as the printing business had not as yet become an outstanding institution in the Colonies. But later on, had Benjamin Franklin chosen to enlarge his printing plant, it is conceivable that books rather than tea might well have become the bone of contention leading to the Revolution.

At the close of the Revolution, the several states passed laws to afford a measure of protection to authors, but these laws were limited in their operation to the boundaries of each state. Hence, if the author of one state wished to secure protection for his work throughout other states he was obliged to comply with a multitude of laws. The same situation prevailed at that time in Europe, but on this side where all spoke the same language and read the same books a uniform national law soon became imperative.[4]

The framers of the Constitution therefore included in that instrument a simple and direct clause empowering Congress "to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Rather than follow the lead of France, which granted copyright protection to all authors throughout the world without the need of complying with formalities of any kind, Congress fell back upon the system of formalities and restrictions inaugurated by the old Statute of Anne, which had been enacted purely as a municipal measure to replace the Licensing Act and, incidentally, to curb the pretentious claims of perpetual copyright on the part of the members of the Stationers' Company.[5]

In 1790 Congress passed the first Copyright Act by which the jurisdiction over copyright matters was left exclusively to the federal government. The Act of 1790 underwent considerable amendment and change until 1909, when it was substantially revised. The 1909 statute provided for an original copyright of twenty-eight years with a similar period of renewal.[6] Presently Congress is considering a general revision of copyright law which will provide that works created on or after January1, 1972 will endure for a term consisting of the life of the author and fifty years after his death. Except for minor changes the 1909 statute constitutes the basis for copyright law as it is today. Copyright is a bundle of all the separate rights in a literary work. (That is, the right to copy, to print, to sell, to publish; the right to translate or make other versions; the right to perform or the right to make a transcription or record). Copyright is intended to protect an intellectual product of the author in any species of publication which the author selects to embody in his literary product. Copyright is not a protection of the idea apart from the thing produced; it is a protection of the tangible result, the concrete form of that idea.

It is important to point out that on May 19, 1964, the United States Copyright Office issued a public announcement stating that it had adopted a policy of considering the registration of claims to copyright in computer programs under certain conditions. The resulting decision is not to be interpreted as amounting to a holding by a court of law that a computer program is in fact a "writing" of an author. It is merely an administrative determination that, based upon existing judicial precedents and statutes the courts might agree that it was a "writing" in the Constitutional sense. The basis for this rationale is that a computer program is a set of instructions. The thoughts expressed in the instructions whether in the form of a flow chart, punched cards or computer language would seem, to the Copyright Office, to be clearly "writings" of the authors.[7]

Common Law and Statutory Protection

A dual system of copyright protection exists in the United States, i.e., common law protection (evolved from the decisions of the courts as distinguished from legislative enactments), and statutory protection. The copyright statute expressly preserves and leaves undisturbed common law rights of the author or owner in his unpublished work. These rights include ownership of the body of the writing; the right to its first publication, the right to prevent the unauthorized publication of the writing, and the right to secure statutory copyright. Once a work is in manuscript form, e. g., a handwritten or typed computer program, it is automatically protected by common law. The author may read it to a friend or do anything short of general publication, and the writing remains the exclusive property of the author.

A general publication or dissemination to the public without the prescribed notice implies an abandonment of the right of copyright or dedication to the public, and terminates the common law copyright. The work thus falls into the public domain and becomes public property, if the author permits a general publication without complying with the copyright act (examples are: unrestricted sale or free distribution of one or more copies to the public).[8]

Compliance with the federal law will insure continuous copyright protection, for statutory coverage begins where common law copyright coverage ends, with the act of general publication with notice. The common law copyright is a pre-publication right. Upon general publication, either the work passes to the public, where it can never be retrieved, or, if the requirements of the statute are met the work is protected.

Registration and Deposit in the Copyright Office

One of the most common misconceptions concerning the Copyright Office is that it issues copyrights. This is simply not true. Copyright in published works is secured by the applicant's own act of publishing copies with the copyright notice (see *infra*, Chapter II). Registration is not required to secure copyright in the first instance, although in a sense it is a condition subsequent to the validity of the copyright.[9]

The statute requires that "after copyright has been secured by publication of the work with notice of copyright," the copies or other material required for registration "shall be promptly deposited in the Copyright Office."[10] It also provides that "no action or proceeding shall be maintained for infringement of copyright in any work until the provisions of this title with respect to the deposit of copies and registration of such work shall have been complied with."[11] On its face the first of these provisions could be taken to mean that copyright is forfeited unless registration is made "promptly." However, in its 1939 decision in *Washingtonian Publishing Company v. Pearson*[12] the Supreme Court held that the right to sue for infringement had not been forfeited because the deposit had been delayed for fourteen months.

Under this decision the Copyright Office will make registration on the basis of a deposit made at any time during the first 28 years after publication. Registration is still required as a condition of renewal for the second 28-year term and must be made before an action for infringement can be brought.

If failure to deposit does not automatically work a forfeiture, why does anyone bother to make registration until he wishes to renew or bring suit? One of the principal reasons is because the Register of Copyrights has the legal authority to demand deposit. It is important to realize that even under the Washingtonian case there is still an obligation to make registration. The federal statute enforces this obligation, not by automatic forfeiture after a certain period, but by authorizing the Register of Copyrights to make a formal demand for deposit of copies when there has been a delay after publication with notice. Failure to comply with a demand makes the copyright owner liable to a fine and results in forfeiture of the copyright.[13]

In addition there are practical reasons why deposits are made as a matter of course. The certificate and public records of registration furnish valuable proof of ownership which may be important in marketing the work. It is also simpler to make registration at the time of publication, when copies and information called for in the application are readily available.

To digress, the term "common law" may be misleading. It was not named for any egalitarian characteristic. It was derived from custom and tradition, and the word "common" was used to distinguish between merely local custom and custom common to all England, and between custom prevailing within special groups (merchants) and custom prevailing among Englishmen generally. The theory was that the courts were merely giving effect to existing usage and practice. The law had always been the law.

To some extent, the theory reflected reality; the common law did embody usage and practice. But to an extent at least equal, the common law embodied the judge's idea of what the law ought to be -- usage considered desirable and practice considered correct. Moreover, the custom was not always clear, and sometimes, there was really no custom at all. Unless history stood still, situations would arise that were not part of any tradition. Then the courts would have to adopt a tradition or invent one. As time went on they invoked broader and broader concepts of what the immemorial common law was (or rather must have been).[14] Whatever elements entered into it -- the influence of custom and tradition, the desire to make rules beneficial to society, the impulse to do right in the specific case (along with inducements to do wrong) -- the common law was in fact made by judges, subject to the constraint imposed by *stare decisis* (to stand by decided matters). *Stare decisis* means that issues once resolved ought to stay that way unless there is an extraordinary reason to change them. This principle is sometimes referred to as judicial precedent.

The common law of England followed the colonists to America where, for the most part, its precepts withstood the Continental Congress, constitutional conventions and the Revolution. Much of the procedural and substantive rules of law followed in this country today are derived from the English common law, particularly in the fields of contracts and property. In the Southwest there is an additional flavor of Spanish influence. Many of the common law rules have been codified by statute in most of the states, except Louisiana. Others have fallen by the wayside retaining only an historical significance.

The other source of law at first seems quite different. Statutes are written rules that come from legislative bodies -- Parliament, Congress, state legislatures, constitutional conventions, and, in earlier times, the King. Here it appears that the rules are not gradually constructed from the inductive combining of decisions, but rather instantaneously decreed in abstract statements that have a fixed and crystalline nature. It is an appearance only. Legislation, in our legal system, has the same agile, pliant quality, that we see in the common law.

Judicial lawmaking is perhaps more apparent where the common law is concerned, but judges also make law where cases are governed by statute. The best legislation does not apply with a clean clarity to all situations, and many statutes that are less than well drafted stand in deep need of construction. If the language of a statute, in its application to a particular case, is capable of two or more competing meanings, the court in choosing one of them becomes something more than a translator.

A little more legal vocabulary, for present and future use: In general, the things courts do are called decisions, orders, judgments and holdings (the court held or found). The reasons they give for what they do are called opinions.

The function of an opinion is to let the community know what the law is and to explain the court's action to the parties. A simple summary of the facts of the case and of the result would tell us a good deal, but it would not tell us enough. We need to know which facts the court deemed significant, the precedents it looked to, the meaning found in statutory language, the weight ascribed to argument of counsel. The court's statement of these things is important principally for the aid it gives in foreseeing what will happen in future cases.

A trial is a way of ascertaining facts; it employs as factfinding devices the examination and cross examination of witnesses and the study of physical evidence, most prominently documents. The law to be applied is determined by the judge, after hearing (reading) argument. A brief is simply a written argument. If there is no jury the judge determines the facts as well as interpreting the law applicable to the case. A verdict is a jury's doing; a judge's determination is a decision. The final exercise of judicial power on behalf of one party or the other is a judgment -- an acquittal or a conviction in a criminal case, a dismissal or the granting of relief (an award of money) damages or a decree controlling conduct (an injunction) in a civil case.

Patents

Most historians credit one Jacobus Acountius, a citizen of Trent, a city of Tirol, with the first written argument or petition for the issuance of a grant of patent. His application was presented in 1559 and provides an excellent argument for the preservation of the patent system today:

> Jacobus Acountius to the Queen. Nothing is more honest than that those who, by searching, have found out things useful to the public should have some fruits of their rights and labors, as meanwhile they abandon all other modes of gain, or at much expense in experiments, and often sustained much loss, as has happened to me. I have discovered the most useful things, new kinds of wheel machines, and of furnaces for dyers and brewers which when known will be used without my consent, except there be a penalty and I poor with expenses and labor, shall have no returns. Therefore, I beg a prohibition against using any wheel machines, either for grinding or bruising, or any furnaces like mine without my consent.[15]

The above quotation should be savored not only because it establishes the origin of patents but it also aids us in the interpretation of today's written law of patents.[16] That is, profiting by the mistakes of others and hopefully predicting something in the future. The patent system is founded upon sound concepts of newness and utility. It transgresses the entire spectrum of the history of this country, which provided incentives for immigration of artisans with special skills from all over the world. Finally, it includes the establishment of industry in this country, and provides a monopoly as a reward for creativity.

The origin of the term "letters patent" comes from the latin, literae patentes which means "open letters." Originally these were documents executed by English sovereigns and intended to be read without the need of breaking their seals as opposed to "letters closed," which could not be read without first breaking the seal. Literae patentes, or letters patent were issued for a wide range of purposes. They were patents for the appointment of judicial and administrative officers, patents of nobility, conveyance of land, and invention. In England these patents conferred rights, privileges, rank or title, personally or indirectly from the sovereign and were recorded on the Patent Role in the Record Office. Letters patent were intended to be open to the public.[17]

In the United States, federal law provides that a monopoly is the "right to exclude others from making, using or selling the invention in the United States."[18] By contrast in England, monopoly is defined as "the sole privilege to make, use, exercise and vent" the invention.[19]

The English sovereign was early endowed by certain prerogatives which allowed him to bestow various freehold interests, franchises and other liberties upon favorite subjects. Such grants were accomplished by the Open Letter Patent where all could see the favor bestowed. The grants were usually given when the sovereign received compensation in return, inasmuch as monarchs at the time were frequently short of the revenues needed to operate their respective administrations. Sales of these grants dated from the Norman Conquest onward and many of them were extremely valuable privileges. For example, towns purchased their privileges from the Crown to hold a fair or market or take toll for merchandise passing through the town. Such grants were common. During the middle ages, merchants and manufacturers in many towns organized guilds for their mutual protection. These Merchant Guilds procured numerous monopolies from sovereigns and frequently monopolized all of the local trade. Craft Guilds also received monopolies from the sovereigns. At this time English industry was far behind the rest of the world. English sovereigns were eager to induce skilled artisans to journey to England to pursue their established trades.

The English cloth industry more than any other was developed through such early privilege grants. In 1331 John Kempe of Flanders received the first Royal grant, and having the avowed purpose of instructing the English in a new industry, he brought his weavers, dyers, and fullers of woolen cloth to England. Letters of protection such as those issued to John Kempe granted no monopoly or immunity to authority. They were mere passports to overcome the strict Guild regulations against competition, and as the number of these patents increased, the Guild Power declined.

The right of the Crown to grant monopolies and privileges had always been recognized. A monopoly right, as distinguished from a mere privilege, like a letter of protection, was in derrogation of the common law right of freedom of trade. Parliament did not hesitate to insist on observance of the Magna Carta of 1225, which declared that all merchant strangers in the realm should be allowed to buy and sell their goods by the old and rightful customs. Nevertheless, attempts at royal grants of trade monopolies were so common that Parliament had to pass statutes outlawing them. For example, in 1373 the King granted the sole right for the importation of wine into London to one John Peachie, but Parliament declared the grant void.[20]

As has been mentioned, letters of protection were issued merely to induce foreign artisans to migrate to England and to establish their trades there. These immigrants may or may not have included inventors. Some historians have claimed that the first patent for a newly invented process was granted to John of Shiedame and his company in 1440. Shiedame came to England to introduce a method of making salt on a scale never before attempted in that country. This might have been only a letter of protection similar to that extended to the early immigrants. Shiedame was not granted a monopoly. There is some indication that King Henry VI granted certain monopoly patents in 1456 for the making of a philosopher's stone for medicinal and other purposes.

The English patent law made greater advances during the Tudor reign than in any other period. The 16th Century could well be called the birth years of the English patent system. As the last of the Tudors acceded to the English throne the country was still behind the continent in industrial arts. Elizabeth tried desperately to develop industry by importing skilled artisans and encouraging enterprising men to undertake the risks of introducing new ventures. She was not without success. Had Elizabeth confined her grant to inventors and procurers of novel, foreign inventions, the loud cries of Parliament at the end of her reign may never have been raised. The events of her reign were such that many persons were able to distinguish themselves in civil and military activities, and Elizabeth, being low on funds, rewarded them with monopoly patents for their endeavors. Once Elizabeth accepted the theory advanced by Acountius that an inventor had a property interest in his invention which should be protected, she created the basis of her patent law. What followed was merely inevitable growth and definition of the scope of the basic principles. It was Elizabeth who first foresaw the value of rewarding inventors.[21]

The English patent system owes much of its existence to the reign of Elizabeth. The history that proceeded and followed her reign contributed to the development of English patent law, but Elizabeth first recognized the great value of rewarding inventors and it was not until her reign that inventors received patents as a matter of course.

Once the idea of granting monopolies regularly was accepted by the people and the Crown, it remained only for the Parliament and the courts to channel this principle into the proper conduit. Overzealous to please her favorites, Elizabeth extended her theory of Acountius far beyond its reasonable bounds. Finding that her subjects would not tolerate this, she gradually withdrew her policies back within the limits of the common law, which limitations had existed long before her reign. While our patent law today may not resemble Elizabeth's, the basic foundations upon which she built are those upon which we now build.[22]

As I have indicated, the history of our American patent system is in reality a history of the growth of our country. Bounties, premiums and subsidies were used to persuade industrialists to settle in the new world during the colonial period. Such rewards were infrequently inadequate inducement. Industrialists, having seen the operation of the monopoly systems of the old world, soon began asking the colonial legislatures or governors for monopoly patents to prevent encroachment upon their arts. Being sorely in need of industry, the colonies granted patents, although not freely.

In the year 1641, Samuel Winslow was granted the very first patent on this continent. He invented a new method for manufacturing salt. And the general court in the Colony of Massachusetts granted him a monopoly for ten years. The grant prohibited all others "from making this article except in a manner different from his" and was conditioned upon his setting up works within one year.

The early colonial patents were issued by special acts of the legislatures, there being no general delegation of power to issue patents. The "Body of Liberties" adopted by the general court of Massachusetts in 1641, expressly prohibited the granting of monopolies but excepted "such new inventions as are profitable to the country, and that for a short time." Other colonies such as Connecticut and South Carolina had similar provisions in their statutes.[23]

After the Revolutionary War, special acts of the legislatures were still needed for a patent grant. But now the idea of the inventor's right in his property began to replace the ancient concept of the patent as a special favor of the sovereign. Then on May 14, 1787, the Constitutional Convention began to meet daily in Philadelphia. The men present were well aware of abuses the English Crown had practiced with respect to grants of monopoly, and were decidedly against the initiation of any similar system in their young government. Yet they knew also the value of a system of protection of authors and inventors, as the history of the Convention bears out. The delegates felt that protection of inventions in literary works by the several states could not adequately preserve common law rights in intellectual property and that this could be done far more effectively by the federal government. The delegates were probably aware of the trouble some authors and inventors had experienced in obtaining protection in the various states. On September 5, 1787, the Committee of Detail reported out to the floor of the Convention, and our present author and inventor clause was approved, becoming Article I, Section 8, Clause 8, of the Constitution.

For the first time in the history of the world a constitutional, organic document recognized that man had proprietary rights in the products of his intellect and that it was in the interest of progress to protect these rights for a limited time. It should be noted that trademarks are not protected under this clause of the Constitution.[24]

Historians believe that the United States Patent Act of 1790 marked the end of common law regulation of patents and that a new concept was born. Important decisions were made by the statute for (1) examination for novelty, (2) written specifications, and (3) a board of patent examiners. For the first time in history, the intrinsic right of an inventor to the fruits of his intellectual labor was recognized by a statute. The subject matter of a patent was defined as "any useful art, manufacture, engine, machine, or devise, or any improvement therein not before known or used." A patent specification, drawing, and if possible, a model had to be submitted in support of the petition for a patent. A board of patent examiners was created. The board had the power to issue a patent if they deemed the invention to be "sufficiently useful and important."

The patent law has seen considerable evolution since the Act of 1790. Probably the most functional amendment was contained in the Act of 1836. Investigations into the novelty and utility of inventions began to take on an orderly form. Perhaps no one will ever truly realize how much the patent law contributed to this country's technological advances during the 19th and 20th centuries, but considerable contribution was made by inventors such as Samuel Morris, Thomas Edison, George Pullman and many others.[25]

The federal courts have throughout the years attempted to provide a fair interpretation of the intent of the framers of the Constitution and of the Congress. Through the decisions of the courts the standard of a patentable invention has been established. A considerable number of the patent claims brought before the courts have been declared invalid. At the same time the United States Patent Office attempts to serve both the inventor and the public, within the framework of the Constitution and of the federal statutes.[26]

Thus we have seen that a patent for an invention is a grant by the government, acting through the patent office, to an inventor of certain rights. The duration of the patent grant is seventeen years and extends throughout the United States, its territories and possessions.

The patent law specifies the general field of subject matter that can be patented, and the conditions under which a patent may be obtained. In the language of the statute, any person who "invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvements thereof, may obtain a patent,"[27] subject to the conditions and requirements of the law. The word "process" means a process or method, and new processes, primarily industrial or technical processes, may be patented. To digress, the computer programmer is interested in the word "process." As we shall see later the courts have defined a computer program as a "process" which may be patented even when not a functional part of the physical equipment (hardware) such as a mechanical, magnetic, electrical, or electronic apparatus. The term "machine" used in the statute really needs no explanation. For our purposes, however, we can include within the definition of a machine, apparatus or hardware.

In order for an invention to be patentable, it must be new, as defined in the federal statute. The law provides that an invention cannot be patented if:

"(a) the invention was known or used by others in this country or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

"(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country more than one year prior to the date the application for patent in the United States..."[28]

Congress established the United States Patent Office to perform the function of issuing patents on behalf of the government. The chief function of the Patent Office is to administer the patent laws as they relate to "letters of patent" granted for inventions, and to perform other duties relating to patents. It examines applications for patents to ascertain if the applicants are entitled to patents under the law, and grants the patents when they are so entitled. It also publishes issued patents, various publications concerning patents and patent laws, records, and assignments of patents, maintains a search room for the use of the public to examine issued patents and records, supplies copies of records and other papers and the like. The Patent Office has no jurisdiction over questions of infringement and the enforecement of patents, nor over matters relating to the promotion or utilization of patents or inventions.

The examination of applications for patents is the largest and most important function of the Patent Office. The work is divided among a number of examining groups, each group having jurisdiction over certain assigned fields of inventions. Examiners perform their work of examining applications for patents and determining whether patents can be granted. Further details concerning the workings of the patent office and the procedure for filing an application for patent will be discussed in Chapter II.

CHAPTER II

COPYRIGHTS AND PATENTS DISTINGUISHED

Despite their common origin and the constant confusion between them in the minds of lawyers as well as laymen, patents and copyrights are essentially different in the subject matter they cover and in the standards, scope and duration of the protection they offer. The "writings" of authors specifically covered by the copyright statutes are books, periodicals, lectures, dramas, musical compositions, maps, works of art and art reproductions, technical drawings and models, photographs, prints and motion pictures.[29]

In very general terms copyright seeks to encourage the creation and dissemination of literary and artistic expression, while patents are aimed at the development of various industrial and scientific fields. To carry out this purpose the United States patent law requires that an invention meet several basic criteria and that the following be established to the satisfaction of the Patent Office before a patent is granted: originality, novelty, utility, and unobviousness[30] to the expert in the art (often programs designed to solve a particular problem on the basis of certain input data will be obvious to the average programmer, and therefore, will not fulfill the statutory requirement of unobviousness).

In contrast, the only standard for copyright protection is originality. This means that if the author had originated his writing independently without copying from the work of another, he is entitled to a copyright even if a similar or identical work is already in existence.

It cannot be over-emphasized that the United States Copyright Office does not issue copyrights. The Copyright Office registers already established statutory copyrights; i. e., if an author (programmer) publishes a program with the correct copyright notice affixed to the "print out," copyright protection is secured as a matter of law.

The differences between the procedures necessary to secure patents and copyrights are equally striking.

As I have indicated little originality need be disclosed to entitle a work to copyright protection. While a copy of something in the public domain which is merely a copy will not support a copyright, a distinguishable variation will, even though it presents the same theme.[31] Similarly an author may obtain copyright protection where he can show a material revision of a previously copyrighted work. It is important to emphasize that the computer programmer should think of such words as "writing" and "copy" in his own terms of reference. Thus he may interchange the word "writing" with the word "program," or "writing" may include the phrase "deck of punched cards" or "printout" or both.

The author or owner of any computer program may secure a copyright.[32] Contrary to popular belief the writing need not be registered with the Copyright Office for a right of copyright to arise. All that need be done to secure copyright protection in the United States is to affix to each copy of the work distributed or offered for sale in the United States, the notice of copyright required by statute.[33]

The required notice of copyright shall consist either of the word "copyright," the abbreviation "copr." or the symbol "©" accompanied by the name of the copyright owner together with the year in which the copyright was secured by publication (see Chapter I for a discussion of publication). Examples of the correct form of copyright notice would be: "Copyright 1970 by Charles Babbage." Strict compliance with the statute is essential, and slight deviations may cause an owner to lose all rights to his work upon publication.

The federal statute provides for a place of the notice of copyright:

> The notice of copyright shall be applied in the case of a book or other

> publication, upon its title
> page or the page immediately
> following it . . .[34]

Here also, there must be substantial compliance with the statute. Applying this caveat to the computer program, it is suggested that a copyright notice be placed on the first header card of a punched card deck identifying the owner with his complete name, the word "copyright," and the year in which it is published (using the definition of general publication previously set forth in Chapter I). Whatever method of input is used, the copyright notice should appear on the first page of the printout. In addition to the copyright notice, I suggest you add the following warning: "All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any other information storage or retrieval system."

A copyright owner has a recourse in the federal courts against those who infringe his copyright.[35]

Statutory Procedure for Obtaining Patent Protection

The preparation of a patent application is a complex and time consuming task requiring technical skill and professional knowledge. Its examination in the Patent Office may take several months and may be quite expensive. Recently the Patent Office has reduced the length of time required for patent examinations. The Patent Office, for its part, must give the application a rigorous evaluation, including a thorough and detailed search of the prior art. A patentee is given no rights until his patent is actually granted; others are free to use his invention with impunity as long as his application is still pending.

The Patent Office search center includes a search room where the public may search and examine United States patents granted since 1836. There was a fire prior to 1836 which destroyed the records of the Patent Office. Patents are arranged according to the patent office classification in three hundred subject classes and sixth-four thousand sub-classes. By searching these categories of patents, it is possible to determine, before actually filing an application for a patent, whether a process, for example, has already been invented and the patent issued, and it is also possible to obtain information contained in the patent as to how the process works. In addition to the search room, the Patent Office search center includes over one hundred twenty thousand volumes of scientific and technical books plus many thousand volumes of periodicals devoted to science and technology which are available for the public to peruse. Also there is a record room where the public may inspect files of issued patents and other open records. Since a patent is not always granted many inventors attempt to make their own investigations before applying for a patent. Patent attorneys or agents may be employed to make a preliminary search of prior United States patents to discover if the particular process, in the case of the computer program or one similar to it, has been shown in some prior patent.

The application for patent is made to the Commissioner of Patents and includes: (1) a written document which comprises a petition, a specification, including a general description and a detailed definition of the invention and how it works (called claims), and an oath or declaration; (2) a drawing in those cases in which a drawing is possible (i.e., a flow chart) and (3) the filing fee.[36]

The petition amounts to the request for a patent and ordinarily includes a power of attorney or authorization of agent. The oath or declaration of the applicant is required by law. The inventor must make an oath or declaration that he believes himself to be the original and first inventor of the subject matter of the application. Finally, the application must be signed by the inventor.[37]

The specification must include a written description of the invention and the manner and process of making and using it, and it is required to be in such full, clear, concise and exact terms as to enable any person skilled in the art to which the invention pertains, or with which it is most nearly connected, to make and use it. The specification must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old. It must describe completely a specific embodiment of the process and must explain the mode of operation and principle when applicable. In the case of an improvement, the specification must particularly point out the part or parts of the process to which the improvement relates. The description should be confined to the specific improvement and to such parts as necessarily coact with it or as may be necessary to the complete understanding or description of it.[38]

The specification must include one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention. The claims are brief descriptions of the subject matter of the invention, eliminating unnecessary details and reciting all essential features necessary to distinguish the invention from what is old. The claims are the operative part of the patent. Novelty and validity are judged by the claims, and when a patent is granted, questions of infringements are judged by the courts on the basis of these claims. The claims are the most important part of the patent. The claims and the claims alone construct a fence around the thing patented and protect it from interlopers. All that is not enclosed by the fence of the claims is public property.[39]

Filing the patent application and particularly the claim drafting requires a combination of professional drafting ability together with technical aptitude in the various scientific and engineering fields. Due to the complex nature of the patent application I strongly recommend the applicant seek the advice of a competent patent attorney who must fulfill both of the above requirements in order to be admitted to practice before the United States Patent Office.[40] For those who desire further information concerning patents they may write the Commissioner of Patents, Washington, D. C. 20231. For those who wish to utilize the facilities of the Patent Office Search Center, it is physically located at Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Virginia.

Since a patent is granted for a term of seventeen years from the date of grant, after which the patent becomes available for the free use of the public, a patentee's rights can be encroached upon only during the seventeen year term of the patent. This applies both to process and hardware patents.[41]

The Patent Act of 1952 adopted the language of the Supreme Court in defining a patent as "the right to exclude others from making, using or vending the invention." In other words, according to this tribunal, it is "the right to be free from competition in the practice of the invention."[42] This right is subject to any rights existing at the time the patent was granted such as prior patents owned by others. For example, if A invented a watch and was issued a patent, B, who subsequently invented an attachment for automatically correcting the watch's time, could not effectively use his invention without obtaining A's permission.[43]

The right to make can scarcely be made plainer by definition. It embraces the construction of the thing invented. The right to use is a comprehensive term that embraces the right to put into service any given invention. Recognizing that many inventions would be valuable to the inventor because of sales of patented hardware or a process to others, Congress granted also the exclusive right to sell the invention covered by the "letters patent." To sell is also a term readily understood. Its use in the statute secures to the inventor the exclusive right to transfer the title for a price to others. Each of these rights can be encroached upon separately, or together, in any combination.

The territory within which the patent right extends is limited to the United States and includes the states and territories and possessions of the United States of America.[44] While the

United States patent right does not extend to foreign countries, a U.S. patentee may avail himself of the patent laws of those countries pursuant to existing treaties.

The present patent law defines infringement as

> Any violation of the patentee's exclusive rights: Except as otherwise provided in this title whoever without authority makes, uses or sells any patented invention within the United States during the term of the patent therefore, infringes the patent.[45]

A person who wishes to make, use or sell a patented invention without liability for infringement to the patentee can acquire an assignment, or license to make, use, sell in whole or in part, either exclusively or non-exclusively, for all or part of a certain territory (see Chapter III, infra, for a discussion of assignments and licenses).

All persons who, without authorization of the patentee, make, use or sell an invention are infringers under the patent law. A patentee has recourse in the federal courts against those who infringe his patent.[46]

Conclusion

Both patents and copyright are monopolies in the sense that each confer the right to exercise exclusive control over the market during a limited period for a particular invention or writing. In another sense, however, the monopoly rights of a patentee are much broader than those of a copyright owner. As I have indicated, a patent carries with it complete control over "making, using, or selling the invention throughout the United States." During the term of protection the patent owner may exclude any other person from the manufacture or commercial exploitation of his patented process or apparatus, even if the other person has developed the same invention independently. Likewise, although the patentee acquires no rights in the general idea or concept of achieving a particular result, he is given a monopoly in the inventive method or means by which this result is accomplished.[47]

In contrast, copyright protects only against those, who, having had access to the author's particular literary expression, proceed to copy or exploit it. The copyright owner has no rights against someone, who, without knowledge of his work, creates a similar work independently. Copyright protection extends only to the author's individual expression in the form of words. As soon as his work is published, all of the ideas, plans, systems, methods, information, or concepts underlying the work or contained in it are dedicated to the public, and are free for everyone to use.[48]

The patent law provides for a single, unrenewable term of seventeen years for process or hardware patents. On the other hand, copyright lasts for a first term of 28 years and is renewable for a second term of 28 years.[49] Under present law, its maximum duration thus is 56 years. However, as I have previously indicated, Congress is contemplating a substantial change in the duration of copyright.

One of the most pronounced contrasts between patents and copyrights arises from the distinctly different treatment accorded them by the courts. Despite the complex and thorough examination by the Patent Office before a patent is issued, the courts have found a large percentage of patents invalid on grounds of lack of novelty or inventiveness. On the other hand, despite the very limited examination made by the Copyright Office before issuing a certificate of copyright registration, the courts have generally upheld the validity of copyrights challenged for lack of originality.

Part of this liberal attitude appears to derive from the reluctance of judges to act as critics and from the belief that, apparently, no great public harm results from extending limited protection to literary works of even marginal value. The imposition of extremely high standards in patent cases may derive from the opposite belief, i.e., as a matter of public policy, monopoly over the development of a particular field should be permitted only if the contributions of the inventor have been highly creative and significant.[50]

Aside from questions of logic and good judicial aptitude, however, the varying attitudes of the courts in copyright and patent cases can have significantly practical importance in those borderline cases where an applicant can choose between the two types of protection.

CHAPTER III

ASSIGNMENTS, LICENSES AND MAGAZINE RIGHTS

As you saw in Chapter I, it is difficult, if not almost impossible to avoid some legal terminology. For example, "assignment," "assigns," "assignor," "assignee" and "license" constantly bob up and about to plague the student of copyright. Some readers may want to know what an assignment is, exactly, as well as its place in the galaxie of copyright. First of all some distinction should be made between assignment and license.

Federal copyright law provides that copyright secured in accordance with its provisions may be assigned by an instrument in writing and signed by the copyright owner.[51] A computer programmer may also assign his copyright in any program he may compose in the future for a valuable consideration and limited in time. Without a time limitation the assignment might be held invalid since it would be inconsistent with the statutory period of copyright which is limited to 56 years, including renewal.[52] It should be remembered that copyright is distinct from ownership of the object copyrighted.[53]

In order to understand the difference between assignment and license let us examine briefly the terms property and ownership as they apply to copyright. In ordinary language when a person speaks of "owning property," he usually refers to the physical object or thing. Thus, "I own a piece of property in the mountains" or "that new Corvette is my property" implies outright and complete ownership of a tangible, identifiable object.

On the other hand, "property" may refer to many rights in a physical object, each of which may be less than full ownership and none of which may be capable of physical possession. We know that a tenant has a property interest in the possession, use, and enjoyment of the premises, although legal ownership is in the landlord. Likewise, the holder of a mortgage has a property interest in the premises, although the legal ownership is in the person who secured a debt by mortgaging the property. Therefore, in a legal sense the term "property" denotes rights in or to things, separate from the physical object itself. It includes the rights to possession, use, control, and disposition of all things having an economic value that the law will protect.

In this sense, property might be likened to a bundle of sticks, each stick representing an interest or right which the law will protect and which may be obtained, retained or disposed of. Thus, if the owner completely owns a house, it means that he has all the sticks. The owner may lease the house to a tenant. This means that the owner still has legal title to the house, but that he has given up one of the sticks--the right to exclusive possession. If the owner then borrows money and gives a mortgage on the house to the lender, the owner has parted with another stick--the right of the lender (mortgagee) to proceed against the house if the loan is not repaid. In this manner property rights in an object may be divided among several individuals. As we shall see rights in copyright may not be divided.

A method by which another may acquire "the rights" in copyright is through the process of assignment of rights from the copyright owner. An assignment is the transfer of rights from the copyright owner to another, called the assignee.

The bundle of rights that accrues to a copyright owner includes the right to copy, to print, to sell, to publish; the right to make other versions.[54] However, unlike the law of property this bundle of rights is "indivisible," that is, incapable of assignment in parts.[55] A transfer of anything less than a totality of rights is said to be a "license" rather than an assignment.[56] If you give someone permission to copy a portion of your copyrighted book, this constitutes an example of a license.

The traditional doctrine of indivisibility is a viable one which must be reckoned with in those situations in which the distinction between an assignment and a license has a substantial significance.

Undoubtedly the most serious consequence of the doctrine occurs by reason of the rule that upon publication, copyright may be retained only if a notice appears in the name of the copyright owner.[57] The problem can best be illustrated in the field of magazine rights.

When an author-programmer of an unpublished and uncopyrighted article or an algorithm, submits his manuscript and is paid by the magazine publisher, it may generally be inferred that the whole interest in the manuscript has been transferred to the publisher. The publisher then owns the manuscript and, as an assignee, is the proprietor (owner) of the work; thus, the publisher may secure the copyright to which the author or proprietor is entitled under the copyright statute. A publisher-owner has authority to copyright with one general copyright notice in the magazine which applies to all separate articles or contributions contained therein in which the publisher holds a proprietary or complete interest. However, if a programmer-contributor to a magazine merely gives the publisher the right or permit to publish the author's algorithm, the publisher is a mere licensee, and not an assignee of the author's entire rights in his manuscript, since the remaining rights of the author have been reserved.[58] To protect the rights of the individual contributor in a license arrangement, the publisher must insert a separate copyright notice and the name of the individual author in the proper place immediately preceding the author's article. In a famous 1951 court decision, "Plaintiff, an artist, created and painted an original work of art on canvas for which he subsequently registered a copyright.[59] He authorized Parade magazine to publish a single reproduction of the painting; however, he did not assign his copyright. Parade obtained a general copyright on the whole magazine, but inadvertently omitted the proper copyright notice of the author on the reproduction of the painting itself. Defendants, as part of a union organizing campaign, published and distributed about 750 hand bills, entitled 'Horse Sense,' which contained a reproduction of plaintiff's painting, copied from the Parade publication. Plaintiff sued for infringement and was denied recovery. The court found Parade was a "mere licensee of a right and was not the proprietor or owner of all the author's rights; thus, Parade, as publisher, was not entitled to a general copyright of the whole magazine that would protect Plaintiff's individual contribution, the painting." Thus the author's work passed into the public domain and the copyright was lost.

The artist should have obtained a promise from Parade to carry a copyright notice, including the author's name on the reproduction of the painting. The programmer should insist that the magazine publisher do the same with reference to his contribution whether it be an article or an algorithm. In the above case, Parade would have been liable to the contributor of the painting if it had promised to do this and had failed to carry out their agreement.

In order to avoid such a disastrous result later, court decisions have strained to find that a magazine publisher acquires all the bundle of rights in a contribution from the author.[60] In a more recent decision a court determined that a serial publication of a novel in the Saturday Evening

Post without notice of copyright other than on the magazine as a whole was sufficient to obtain a valid copyright on behalf of the author-owner of the novel where the circumstances under which the magazine purchased merely serial rights in the novel, showed that the author-owner had no intention of donating his work to the public.[61]

In view of the confusion among authors and some lawyers concerning the legal implications that may arise from the grant of magazine rights, extreme care should be exercised by the programmer who wishes to be sure that his contribution will not enter the public domain upon its magazine publication.

The problem posed could be resolved by an agreement with a magazine publisher than an additional copyright notice must be placed on the article in the name of the author. This would satisfy that segment of legal authorities that claim a magazine publisher receives merely a license. Perhaps the author desires to retain certain rights, e.g., book publishing rights, but either wishes or is required to confer upon the magazine publisher ownership of the copyright rather than a license (magazine publishers might prefer an assignment of all the rights). The most certain method of accomplishing both of these objectives is for the author to assign all the bundle of rights to the publisher and then by a second step, the publisher can assign back all rights except magazine rights.[62] A third method of carrying out the author's intent to retain all rights in his contribution other than magazine rights, would be to permit the publisher to obtain the copyright in its own name and subsequently assign the whole bundle of rights (except magazine rights) to the author. In the latter two instances, the statutory notice of copyright carried in the name of the publisher would protect the work from passing into the public domain.[63]

Now that you have some idea of what an assignment entails let us examine the concept of license. "License" implies the granting of a narrow permission to perform some act. While assignment is the complete transfer of ownership, licensing simply legalizes the doing of certain acts that otherwise can be done only by the copyright owner. While the same rights that may be assigned may also be included in licensing arrangements, the licensee cannot transfer his rights whereas an assignment may be reassigned.[64] A licensee cannot sue for infringement in his own behalf. Any suit for infringement must be pursued jointly with the copyright owner.[65] As we have seen a copyright notice must be carried in the name of the copyright owner or his assignee. More importantly, if a licensee publishes without carrying a copyright notice in the name of the copyright owner (or his assignee) on the article, the work may pass into the public domain and the copyright would be lost. Therefore, general notice carried in the name of licensee would be ineffectual.[66] Although the licensee may not register copyright in his own name, he may record the license with the copyright office.[67] License may be granted to one person in which event it would be exclusive, or to more than one person in which event it would be nonexclusive. Exclusiveness may also relate to geographical areas. Thus a non-exclusive license in this frame of reference would infer other licenses might be granted for different territories.

It is of the utmost importance that a license explicitly set forth whether or not it is, exclusive or non-exclusive; limited or unlimited, territorially. Finally, its duration, limited or unlimited, should be stated.

The copyright statute provides for recording of assignments in the Copyright Office. This should be done within three months from the date of the assignment. Recordation in the Copyright Office constitutes notice to the "whole world" of the assignment to the new copyright owner.[68] Although the Copyright Act makes no provision for recording licenses, the Copyright Office will record them in the same way assignments are recorded and it is advisable to have this done.

With some exceptions the principles applicable to copyright also apply to patents. Generally speaking the rules of contract law govern assignments. As we have seen, however, copyright's "doctrine of indivisibility" may impede the assignment of shares or parts of the whole bundle of rights. Such is not the case with patents.

In 1891 the Supreme Court of the United States clearly defined what was necessary to constitute an assignment and to distinguish it from a license:

> The patentee . . . may assign, grant and convey, either

> 1st, the whole patent, comprising the *exclusive* right to make, use and vend the invention throughout the United States; or 2d, an undivided part or share of that *exclusive* right; or, 3rd, the *exclusive* right under the patent within and throughout a specified part of the United States. . . . A transfer of these three kinds of interests is an assignment, . . . and vests in the assignee a title in so much of the patent itself, with a right to sue infringers; . . . . Any transfer, short of one of these, is a mere license, giving the licensee no title in the patent, and no right to sue in his own name for an infringement.[69]

An example of the *first* of the above categories would be the conveyance of the "exclusive right to make, use and sell the patented invention without any reservation of rights of the assignor (owner). An example of the *second* category would be the assignment of 25% of the ownership of the patent. This results in co-ownership of the exclusive right to make, use and sell the investion. Royalties or profits would be divided, 75/25%. An example of the *third* category would be the conveyance of the exclusive right to make, use and sell the invention throughout the State of Colorado with no reservation of rights in Colorado by the grantor/owner.

Using the example of the watch and automatic time correction device referred to in Chapter II, *B,* who invented the time correction device might give *A,* the owner of the patent on the watch, the *non*-exclusive right to manufacture and sell the time correction device as an attachment to *A*'s watch. In return *B* would reserve the right to manufacture the time correction device as an attachment to *A*'s watch. As part of the agreement, *A* would give *B* the *non*-exclusive right to manufacture *A*'s watch. Both rights granted and received by *A* and *B* would exemplify licenses.[70]

Next let us explore the aspirations and misgivings of the computer industry.

CHAPTER IV

THE COMPUTER INDUSTRY, PATENTS AND COPYRIGHTS

In today's expanding age of scientific and technological advances, the electronic computer has captured both the imagination and the spirit of the times. Its usefulness in a new age of science, together with its growing applicability, reflects its importance and permanence.

Since the introduction of the Eckert-Mauchly Univac I in 1950, the development of the computer has proved one of the largest, fastest growing industries in the world. Computers have found extensive use in such diversified areas as business date processing, scientific research, commercial banking (financial institutions), communications, education, government activities, retailing, and legal research. Similarly, progress in the electronic technology of computer circuits, the art of programming and programming languages and the development of computer operating systems has been rapid.[71]

The computer industry, has, in fact, followed a classical pattern of growth for a new industry based upon emerging technology. From 1943-1949, individual organizations, universities, and Federal Government laboratories, pioneered electronic computing and data processing technology. In 1947 through 1955, small, new enterprises with highly skilled people formed to develop computer technology. At the same time large organizations became committed to the computer manufacturing business through acquisition of pioneering small firms or by internal expansion. From 1955 to 1964, major manufacturers educated their customers on a broad scale in the use of computer technology and its products. Finally, from 1964 through 1971, computer customers acquired growing sophistication. They began to influence the direction of new product development. With an increasing standardization of computer products, technology matured. The periodic improvement in computer systems resulted in a transfer of the benefits of the technology to a broader base of customers with non-professional skill. Finally, the computer services and support business experienced a steady growth.[72]

Probably the single most important impact on the business opportunities facing the producers and sellers of software came in 1969 when the industry's largest computer manufacturer announced the decision to price separately many of the software products that had previously been "bundled" within the purchase or rental fee paid for computer "hardware" by computer users. This new marketing policy has stimulated the rapid emergence of several new industries with identifiable markets, products and services.[73]

User investments in computer programming during the past six or seven years has also experienced a dramatic growth. In-house investment in programming has grown nearly fivefold while user expenditures for programming support and packages have grown over twenty-six times in the same period. Of commercial users, banking and financial institutions are the largest purchasers today as a group and show the sharpest rate of gain in the future as a group.[74]

The critical resource in the software is, of course, skilled personnel. Therefore a key measurement of the size of the software business is the number of people professionally employed in it. The estimated number of systems analysts and programmers employed by computer manufacturers during the last seven years increased from 7,000 to 25,000, while those employed by software firms during the same period increased from 500 to 9500. Sparked by lucrative offers and an opportunity to achieve more identity in a smaller firm, many analysts and programmers employed by both user and manufacturer organizations have moved into the software houses.

The principal solution to software problems in the future, as it has been in the past, is an infusion of people with skill, rather than the raw application of dollars. It seems clear that major elements in the computer industry including most of the large suppliers, have recently geared themselves for mass-production education of persons in every age group, covering the full spectrum of skill needs in the industry. Also, it would seem to follow that users themselves, in line with the growing awareness of self-help, are embarking on major in-house training efforts within their own computer professional staffs.

I realize it is important from industry's standpoint to distinguish between the operating systems program and the proprietary software product or packaged program. Whatever these differences may entail, the current dilemma which the entire computer industry faces concerns the dubious protection, under the law, of both types of programs.

In this connection it is important not to overlook the desires of industry in the area of protection whether through copyright, patent or trade secret. I am certain that the desires of industry are not uniform but rather are as divergent as the various interests represented. There is one common denominator, though, and that is the two-way pull which is exerted on the views of programmers by (1) the desire to make use of programs of others without being held to have infringed, and (2) the desire to have some protection for their own programs.

The impending revisions of the patent and copyright laws, insofar as they deal with protection of computer programs, have brought a controversial response from the industry. Manufacturers of hardware seem to be generally opposed to both forms of protection, reasoning that widespread and efficient use of new programming techniques might be inhibited. However, the software companies seem to advocate protection, apparently to maintain their competitive advantage derived from advanced research.[75]

These software companies consider the lack of protection to be an obstacle to growth, and argue that it discourages the marketing of proprietary programs. They believe that the protection from plagiarism, and the incentive to publication which patent and copyright both provide would eliminate duplication of effort among competing firms, remove the secrecy that now surrounds proprietary programs due to restrictive covenants in contracts for lease and sale, and permit the development of programs that can be produced for profit only if they are sold more than once. However, some software proponents are opposed to the use of the copyright system because the protection it affords is not sufficiently broad, and to the patent system because rapid obsolescence would require continual refiling.[76]

The copyright of a program would not preclude the development of a similar program by others. Program patents might grant absolute protection, but to a seemingly limited group of programs containing unobvious concepts. That is, many computer programs will be unpatentable because they are obvious to a skilled programmer. Often programs designed to solve a particular problem (end result) on the basis of certain input data will be obvious even to the average programmer. Yet the output of a computer meets the standard of originality of copyright under many circumstances, and the patent standards of unobviousness and novelty in others.

Because of the uncertainties of copyright and patent protection most software companies have generally treated their programs as trade secrets.[77] In order to receive protection under trade secret law, which is based upon the law of unfair competition, the primary requirement is that the program be kept secret; for this purpose employees can be bound by contract not to divulge to competitors the employer's secret program. The program can, however, be sold or leased with contract provisions prohibiting disclosure to outsiders, the general practice in the software field, without forfeiting legal protection. If a secret program is acquired through improper means, such as by theft, bribery or in violation of a valid contract requiring that the program be kept confidential, the program owner can seek an accounting of profits and, in appropriate cases, injunctive relief (preventing continued conduct in the future) from the courts.[78] These remedies will also operate against persons who obtain the secret from one whom they know was given the program in confidence. Owing to the strong interest in maximum labor mobility, there are more difficulties in restraining former employees from disclosing secret programs; but the courts have decided that while former employees can continue to make use of their general experience, they cannot disclose or use specific trade secrets. It shall be noted, however, that the law of unfair competition prohibits neither independent creation nor use of similar techniques. Thus, there is little uncertainty about what processes and techniques a programmer may use; any secret he can come by without abusing a confidential disclosure may be used or sold without liability.

The most basic reason for allowing trade secret protection lies in the fundamental notion of "fairness" or equity, which runs as a tough fibre through Anglo-American jurisprudence. Mr. Justice Holmes expressed the proposition succinctly: "The plaintiff has the right to keep the work which it has done, or paid for doing, to itself. The fact that others might do similar work, if they wished, does not authorize them to steal plaintiff's."[79]

In a manner exemplary of its typical workings, the common law crystalized this particular notion of fairness, into a concept of public policy as applied to commerce. Whatever the legal basis produced for the policy's justification, the courts were unanimous in holding that parties who violated the policy simply would not be allowed to reap the benefits of their bad faith. Again it was Holmes' laconic eloquence which ennunciated this principle into law: "The word property as applied to . . . trade secrets is an unanalyzed expression of the primary fact that the law makes some rudimentary requirements of good faith."[80]

Underlying this requirement of good faith is the concept that if society lets the wrongdoer profit from his act, the ensuing deleterious effect on the developer or owner of the secret may significantly deter others who would develop things useful to society. Protection, then, is necessary lest the urge to advance and create be stifled.

This wrong is sometimes placed under the legal rubric of unfair competition, which many courts have expanded beyond its original meaning of palming off.

Inasmuch as the various doctrines of trade secret law emanate from the law of unfair competition, the notion of balancing both social interests and the equities of the particular parties is inherent in this area of law. In a good example of this balancing process, one court dealt with the problem of innocent use, deciding that, in the particular case before it, the balance lay in favor of the user.

These are a number of areas where trade secret law has developed "a reasonably satisfactory adjustment of public and private interests:" Providing the originator with a "head start" over his competitors; protection against misappropriation by employees; limiting the scope of restrictive covenants by prohibiting them where they unduly and unreasonably tend to create a monopoly, restrict competition or restrain trade; denying protection for vague, general ideas; encouraging disclosure by imposing risk of loss when public.

This balancing is not a static situation. The world of business is a dynamic one, and concepts of commercial ethics change with time. According to another court: "The question is whether the injury is of the kind which, in a relatively free economy, the plaintiff is obliged to suffer. Is it akin to lawful competition of which plaintiff cannot complain? The line of demarcation is not always distinct and may vary from generation to generation as standards of business ethics move up and down."[81] "The general trend has undoubtedly been upward."[82] "The felt necessities of the time, the prevalent moral and political theories, institutions of public policy, avowed or unconscious, even the prejudices which judges share with their fellow men, have had a good deal more to do than the syllogism in determining the rules by which men should be governed."[83]

This, then, portrays the fundamental social basis underlying trade secret protection, and how the concept of trade secret protection worked its way into the web of the law through the pigeonhole of unfair competition.

Clearly there is nothing about a computer program which places it outside the ambit of material for which trade secret protection is socially desirable. To the contrary, programs are an industrial development and should, from a policy viewpoint, be treated accordingly.

Although it tends to discourage publication of new techniques and ideas, trade secrecy's effective protection against plagiarism seems preferable to that offered by copyright or patent according to some theorists. The limited scope of copyright would seem to make it an ineffective device for protecting proprietary programs and thus it is a doubtful antidote for excessive secrecy.[84]

Weighed against what might be a small benefit is the danger that the courts will inappropriately extend copyright from the explicative to the techniques in the program. Patent, although an effective protective devise when granted, might not be available for many proprietary programs and may thus have little effect on plagiarism or as a spur to publicity. The benefits of patent protection do not seem to outweigh the risks of economic monopoly, the addition of legal costs to programming, the possibility of confusion of legal rights, and the difficulties of administration.

Furthermore, any decision in favor of a patent-like system of protection for software would normally create a measure of economic power in the software developer. This might enable him to restrain competition in a number of ways.[85]

One of these would be through the licensing process. Needless to say the Department of Justice has been actively engaged in applying the Sherman Antitrust Act to a variety of licensing restraints--including territorial limitations, patent pools, cross-licensing, grantback limitations and others.[86] Software owners would have to be concerned with the evolving rules in this area, and perhaps with special rules primarily directed at the software licensing context.

A second possible restrain could be found in the use of tie-ins. A tie-in is illegal under the Sherman Act, §1, or the Clayton Act, §3, where the seller has economic power over a product and he sells that product only on the condition, in effect, that the buyer buys another product (the "tied" product).[87] The seller is presumed to have economic power over a patented product.[88] The rules in the tie-in field have been expanded markedly in the recent past.[89] The implications of the antitrust tie-in rules for the computer software field are pretty clear. The common existing practice of providing computer programs on a package basis has not seemed a source of major concern so long as computer programs have only been protected as trade secrets; since successful programs at times can be effectively duplicated by others, a particular program is less apt to be regarded as the source of the type of economic power necessary to make it a tying product. Actually most of the complaints to date have been based on the theory that computer programs were the tied product in a hardware-software tie-in. This is likely to change if software becomes subject to some type of patent or copyright protection. A particular patented program may become indispensable to users in a particular field; it will thereby become a real source of economic power--and the strictures of antitrust laws will have to be vigorously applied to prevent its use as a tying device. Therefore, one might conclude that any switch to a patent-type form of protection for computer programs is likely to enhance the importance of antitrust laws in the software field.

From the foregoing it appears that neither our copyright system nor our patent system provides a complete answer to the protection of computer programs. Confronted with the question of how does a client protect a computer program, the legal profession examined the patent and copyright laws as alternatives to the trade secret approach. Some lawyers and businessmen, alike, suggest a software protection system which is a combination of copyright, patent and trade secret. Others advance the possibility of new legislation specifically directed at computer programming. In Chapters VI and VII we will examine in detail copyright and patent protection, today. In Chapter VIII we will explore Third Generation protection for tomorrow. In the meantime be assured that the legal profession is well aware of the caveat that the law should not shape the business practices, stretching them here and cutting them off there. I believe the aim is to determine first, the optimal ways in which the software industry can advance its art and market its product, after which the legal possibilities should be canvassed to facilitate the best solutions to the business questions and related matters of general public policy.

CHAPTER V

EMPLOYER-EMPLOYEE RELATIONS

In the previous chapter I have alluded to contractual relations between employers and their employees in the computer industry. In this chapter I shall discuss in greater detail the status of the computer programmer as an employee in both private industry and in government, and the effect of this status on the ownership of computer programs.

The confusion which may arise when an employee, through his creativity or inventiveness, writes a new program, makes some type of written agreement almost a necessity in modern business. The employer hires technical personnel with the understanding that they are to improve the company's operations; the employer provides at no expense to the employee, technical facilities, materials, assistance and necessary capital; and pays the expenses of copyright registration (which are admittedly minimal) or the expenses of patent search and applications (which are considerably higher) and assumes all the business and legal risks involved. When an employee is new to the business, the employer may train the employee and supply him with specialized and confidential knowledge which he could not acquire in the absence of employment. On the other hand after an employee has been trained and begins to make that Chameleon-like change from the overpaid to the underpaid at which point, if any, should the employee receive additional compensation, for his creativity or inventiveness in the designing, writing and successful testing of a significant computer program?

In general, it is customary for management to require the invention contract to be signed by all salaried employees, regardless of job classification, when they work under such conditions where there is a good possibility of making inventions. However, it is not customary to have such contracts signed by hourly workers or members of labor unions. In addition, the following types of salaried personnel are usually excluded: secretarial, clerical, security, cafeteria, accounting, and shipping.

"Employment," of itself, is sufficient compensation to require an employee to assign to his employer all rights to inventions relating to the employer's business. That is, when an employee is hired he usually is required to sign a contract which provides (1) the ownership of his inventions will be assigned to the employer and (2) the employee will not be entitled to royalties or additional compensation. In my opinion this would certainly include programs. It appears that there is a tendency to give the employee, in addition to salary, a fixed money award for each invention. Some companies have found that such awards stimulate invention. However, very few employers are willing to give the employee a share in the income or savings resulting from the use of the invention.

Such arrangements are difficult to administer and are contrary to the premise that the employee's salary is full compensation for the invention.[90]

Some employment contracts seek to hold the employee responsible for assigning inventions to the employer for a period of time after employment ends or to restrain him from working for a competitor of the employer. In general, such "hold-over" clauses do not violate public policy unless the restraints of time, employment and other subject matter are unreasonable. In general, the "hold-over" should not be more than one year and the subject matter should be limited to inventions relating to the employer's business. Again this would certainly apply to computer programs created or invented by the employee. The tendency in industry is to provide some extra compensation for the hold-over period in order to make such clauses enforceable in the courts, the latter having held that the "hold-over" clause must be reasonable and just and strictly construed.

It should be understood that no contract is valid that denies a man the right to earn a living. This may be expressed in the words that a man's tools cannot be taken for debt or that the operations of his brain may not be mortgaged. Taking of property necessary for one's livelihood was outlawed in the Magna Carta.

Any broad limitation to the effect that a programmer may not accept other work in the software industry is obviously improper and void.

Restrictions on future employment, if they are to have any chance for enforceability must define the forbidden fields clearly.[91]

The general administration of the contract should be under the jurisdiction of the corporation counsel or legal department. The binding of new employees under such contracts should be the obligation of the Personnel or Industrial Relations Department. In Appendix C, I have included two confidential employment clauses which could be included in a final employment agreement.

The binding of previously employed personnel should be the obligation of the manager of the manufacturing unit or the manager of the technical department concerned.

The employee should be allowed full opportunity to express his reasons for refusal to sign such contracts. Explanation and persuasion are the best procedures. In some cases, slight modification of the terminology, and in rare cases, of the substance may be granted where the particular conditions warrant changes; but no broad exception should be permitted, even if it means a choice between signing or losing the perspective employee, the final decision at this point being the responsibility of management.

If an employee, who is required under a contract to assign his programs to the employer, refuses to assign and execute an application for patent, the appropriate remedy is for the employer to execute the application, and this is permitted under federal law.[92]

The ownership of and compensation for employee inventions in countries of Western Europe, Canada and Japan are particularly significant to United States companies in view of their extensive research, development activities, or other interests in those areas. It is essential to know and understand the legal requirements of the various countries in respect to the ownership of inventions of employees and what the laws require in the way of compensating employee-inventors. The laws on this subject are different in each country, and it is difficult to categorize them. A prospective employee should consult a qualified attorney, and of course management would have the benefit of advice from their own legal department.

The fact that the inventor is a company employee under an employment contract does not necessarily mean that the company is free from the problem of the outside inventor. If the program is one which was written before the employment contract came into effect or is one of the class of creations or inventions which was excepted from operation of the contract, the employment relationship has no bearing. In this case, the employee would be in the same situation as an outside inventor. Some companies take care of this by requiring, at the time the employee signs the usual invention-employment agreement, a statement listing all inventions made prior to coming with the company.

Another situation arises when a company hires from a competitor, an employee who has had access to confidential and proprietary information of his former employer. This is a situation which requires considerable care to avoid being accused by the former employer of plagiarism or of taking advantage of that employer's confidential information. One solution is to put the employee on projects other than those he may have worked on during his previous employment. At the very least, the employee should be clearly informed in writing that he should not utilize the secret and confidential information from his former employer. It would likewise be very imprudent to put him on work of exactly the same competitive type of project or computer program.[93]

In the relationship between an employee-inventor and employer, there appear to be two extreme situations. In one, the employer receives complete ownership of the employee's invention or creation. In the other, the employee-inventor retains full ownership of his invention which includes obtaining the patent in his own name. Shop Rights fall between these extreme circumstances, in an area where the law recognizes some right of the employer to the invention, but not to such extent as to extinguish the inventor's right completely. A Shop Right belongs to the employer if his facilities were used in the development of the invention.[94]

The employer is entitled to Shop Rights even where the employee has done work on his invention outside the scope of his employment, using his own time, tools, and materials at the beginning, and only in later stages of the development, has used his employer's property.[95]

Where the inventor wishes to demonstrate his invention to the employer for the mere purpose of satisfying the employer's curiosity as to the merits of the invention, and the inventor uses the employer's property to build suitable demonstration models or modify existing models to better suit the employer's purpose, no Shop Right will accrue to the employer. The inventor's cooperation and assistance for the purpose of such demonstrations will not prevent him from later asserting his rights of ownership in the invention.[96] When the employer's property used by the inventor is of very slight value, or the employer's contribution to the invention is minimal, Shop Rights are denied the employer.[97]

As indicated in Chapter IV disclosure of trade secrets by employees or former employees is a cause of increasing concern and worldwide importance.

The cause is obvious. The annual expenditure for research is now in the billions of dollars per year. Research secrets have become the handle to industrial power, and the company that doesn't have any secrets to protect really isn't in the business of competing. And it should be remembered that all the information resulting from a major research in the area of computer programming might fit into a briefcase.

It is not surprising that a termination of employment may lead the ex-employee facing perhaps a seeming bleak outlook, to brood on real or fancied unfair treatment, recall that he was paid less for creating a new program than he thought he should have been, and seek the seemingly easy road of selling the secret information for a fee or a new position.[98]

Although we have discussed the field of law known as trade secrets or unfair competition it might be emphasized that owing to the strong interest and maximum labor mobility, there are real difficulties in restraining former employees from disclosing secret programs; and while employees can continue to make use of the general experience, they cannot disclose or use specific trade secrets.[99]

Since the program must be kept secret in order to receive protection, the employer-employee contract referred to previously should provide for nondisclosure of secret information. This has the disadvantage of keeping new techniques secret and encouraging a duplication of programming effort among competing firms which could be avoided by publication of new techniques. Nevertheless, there is still wide-spread dissemination of new ideas and techniques through trade journals and conventions, and techniques developed by manufacturers or in the academic community which are freely communicated. In addition, employee mobility between competing firms lessens the problem of secrecy by allowing others to benefit from the programmer's general experience. Although duplication of effort remains, it may be normal in a competitive system and conducive to technological growth. Having people work toward the same goal in a competitive situation is encouraged, partially on the theory that this duplication will result in higher quality products at lower prices. And since trade secrecy permits the retention of the competitive advantage derived from better products, software companies are encouraged to develop more efficient programs because they know that sales covered by a contract for nondisclosure will have protection from theft or plagiarism.

Should a company solicit ideas from nonemployees or other sources outside the company? Although the answer to this question is not directly related to employer-employee relations, it is topical and requires some comment.

While many programmers and systems analysts are employed by large corporations there is a growing number who are employed by independent software firms. There are even some who are self-employed, and, along with the independent firms offer contact and technical services under contract to a specified customer. In addition there are many academicians who perform faculty research in the field of computer science by writing programs, in which, depending upon their employment contracts, they may retain a proprietary interest. To some extent they fall within the category of self-employed.

If a company manufactures hardware or produces software about which the public is somewhat knowledgeable, it seems a mistake for it to cut itself off from the public's ideas relating to these products. Not only is it poor public relations, but sooner or later the company is going to miss an idea or an invention that is worth all the risk and much more. The fact is that even the best of companies may become a little ingrown in their proprietary lines, and anything that shakes up their routine thinking is valuable and well worth what it may cost in compensation for outside creativity or inventiveness. According to the experience of a number of corporate legal departments, not one of their companies has lost more on lawsuits based on outside disclosures than the cost of operation of their research departments for a few weeks.[100]

Not only would it be good public relations for a company to accept unsolicited outside disclosures, but provided certain precautions are taken it is also good business.

Hardware manufacturing companies receive unsolicited letters from self-employed programmers, members of the academic community or even from the general public, describing some improvement or new idea to improve the company's products. Frequently, the letter will express the wish that the disclosure made by the sender be held in confidence. Sometimes there may be a request for compensation.[101]

Once such a letter has been received, the company is faced with a problem which can be troublesome if it ever happens to use the unsolicited idea. Moreover, when a number of unsolicited ideas run into the hundreds, there is a chance that whatever the company may do in the way of independently improving its own product in the case of hardware or a program, will come close to one of these disclosures, resulting in a possible lawsuit.

For its own protection the company must do something positive at the outset to negate the implication that it received the disclosure in confidence and should compensate the sender, if it later makes use of the disclosure. For this reason, a number of corporations, if they can do so, refuse to receive disclosures from unknowns. They believe that they never get ideas worth the risk and that the poor public relations from refusing to receive outside ideas is less than would result from the necessary turning down of the many ideas received.

Even refusal to deal with outsiders does not completely solve the problem of unsolicited letters setting forth in detail an idea for which the creator desires compensation. It had been remarked that the only way a company can fully protect itself is by not reading its mail.

It is true that much of the risk can be avoided by simply refusing to receive outside submissions by immediately returning them with a letter explaining that it is against the company's policy to receive them.

For complete effectiveness, however, the return should be coupled with some systematic procedure by which the disclosures are segregated from any of the company's technical personnel.

Under the common law, that is, the rule of law evolved from many decisions of the courts and not necessarily codified into statutes, the creator of an idea owns that idea. He can practice it in secret and will be protected in maintaining that secrecy. As we saw previously, when and if the creator discloses his idea, however, retention of his rights depends upon the method of disclosure and precautions taken in disclosing it. If he copyrights it, he retains the protection resulting from such registration. If he patents it, he retains the protection allowed by patent law. The broad rule is that there is no residual property interest protectable by law in an idea or disclosure which is communicated to third parties without reservation.[102] To hold the recipient of his disclosure legally responsible, the inventor or creator of an idea must show (1) something more than the mere disclosure of his mental labors and (2) use for profit by the one to whom disclosure is made.

In order to demonstrate the current trend regarding "idea piracy," I have included a recent decision of a New Jersey court which is indicative of the approach by the courts generally, toward a sometimes nebulous concept. The decision of the New Jersey court was based on principles of contract law which have evolved from the Common Law and have been codified by New Jersey statute. This decision does not involve an application of Federal copyright or patent law.

> Fleming v. Ronson Corporation, 258 A. 2d 153, 108 N.J. Super. 311, (N.J. Super. Ct., October 29, 1969).
>
> Action for idea piracy. In 1955 plaintiff wrote defendant that he had an "idea" for a household item which had "never appeared on the market" and asked whether defendant would like him to submit his idea. Defendant invited plaintiff to forward further information and plaintiff subsequently submitted details of his idea for a "metal candle to be used with liquid or compressed gas fuel" and sketches relating thereto. Plaintiff was subsequently advised that defendant was "not interested in /his/ idea at the present time," although contrary to defendant's prior assurances, plaintiff's sketches and submission of details were not returned. Some years later plaintiff noticed defendant's advertisements for its Varaflame gas candle and, after failing to secure settlement of a claim for compensation, instituted the instant litigation.

The court determined that Ronson Corporation (defendant) had not pirated Fleming's (plaintiff) idea and discussed the general grounds for recovery even for unsolicited ideas. The programmer might substitute himself for Plaintiff Fleming as the court's discussion is read along with my comments which draw an analogy to the problems that might confront the programmer.

> [Defendant] did not promise to pay for the mere submission of an idea. All that can be derived from the correspondence is an invitation to [plaintiff] to submit details for evaluation coupled with an undertaking to contact him for further arrangements should the proposal be of interest. . . . [Defendant's subsequent letter] states its lack of interest at the time. The minds of the parties never met on a proposed sale or purchase of plaintiff's idea. . . . The law will not imply a promise on the part of a person against his own express declaration.

An express contract would arise when the programmer asks for compensation and for procedures to be held confidential, and the company expressly consents. However, even assuming a problem-solving computer program may not be copyrighted or is unpatentable, it is easy for a company to expressly agree to hold it confidential and, if the concept is later published or put in public use, find itself the only one in the world who cannot use the idea without paying for it.[103]

Thus, the court determined that even had Ronson Corp. (defendant) used Fleming's (plaintiff) idea, no express contract was established.

The court then stated the theory of liability under quasi-contract (unjust enrichment) as follows:

> Where there had been an unsolicited submission of an idea such as here, the question which arises is whether, on the facts presented, the recipient is liable, if at all, by reason of a quasi-contractual obligation based on the doctrine of unjust enrichment. An idea, as distinguished from the copyrighted contents of a book or a patented device or process is accorded no protection in the law unless it is acquired and used in such circumstances that the law will imply a contractual or fiduciary relationship between the parties. . . . Generally, one who receives a benefit which it is unjust for him to retain ought to make restitution or pay the value of the benefit to the party entitled thereto. . . .

This premise requires willful and knowing appropriation of a novel idea (flow chart) of the creator. Although not relied upon as much as the implied-contract theory, the unjust-enrichment argument is often used to buttress the implied contract basis for recovery. Implied contract is the relationship which is the main source of difficulty. Applying the rule to a situation confronting a programmer, it would generally include two elements: (1) an implied agreement to keep the disclosure (flow chart, series of instructions or procedures) confidential if no other arrangement is made with the inventor or creator, and (2) an agreement to compensate the submitter if the problem-solving program is used. The troublesome thing is that often there is no specific request by the inventor for confidential treatment and no thought on the part of the company that by its conduct it is agreeing to such an arrangement.

Ronson Corp. asserted that plaintiff's idea lacked "concreteness" and that mere abstract concepts cannot be the subject of actionable misappropriation under the theory of unjust enrichment. The court held, however, that:

> . . . it is unnecessary to consider whether an abstract idea can be the basis of a contract. . . . The concept submitted by /plaintiff/ is not an abstract one in the sense that it is incapable of physical form. Rudimentary as it is, the idea can be transformed into a product. It is, to that extent, concrete and usable.

Defendant claimed that plaintiff's idea lacked novelty and therefore that he had "nothing to offer" which could be the subject of a quasi-contract claim. The court held that:

> . . . although novelty has been considered significant in /numerous prior cases/, this element is more important for its evidentiary value than for substantive quality.

The court continued:

> In other words, where the issue is whether one's idea has in fact been used by another, similarities between the submission and the ultimate product may justify the factual inference that one was copied from the other. . . . If the concept submitted is unique, or if there are many points of likeness, the inference is strengthened. On the other hand, a lack of novelty or the existence of many dissimilar features will support a denial that the idea was used by the recipient.

Observing that "the issue in the present case is thus narrowed to a determination of whether [defendant] actually copied or used plaintiff's idea, or was aided by it in developing its own product, the court concluded that defendant had not so (wrongfully) appropriated plaintiff's concept. The court said:

> The court finds from the evidence, that, despite a superficial resemblance between [plaintiff's] sketches and the Varaflame candle, the similarity is mainly with respect to shape. Not surprisingly, each looks like a long, taper candle of the kind used for table decoration. The [plaintiff's] candle operates on the basic principle of a wick inserted into liquid fuel, no different from an

ordinary cigarette lighter. Although there is a suggestion that compressed gas can also be used, no explanatory details are furnished. The [defendant's] product, designed to operate on butane gas, is not a simple device; it consists of many component parts, including an outer shell or sleeve, an inner shell, a tipped nozzle and liner, a base plug, cams, springs, seals, and washers; and, particularly, an inlet valve assembly and a burner valve assembly, each of which is a small but complex unit.

The court finds further that even though [plaintiff's] concept may have been new to him it was not a novel one. At best, what [plaintiff] had in mind was a different application of a long-established principle. As far back as 1871, a patent was issued for a cylindrical, "hydrocarbon candle" consisting of a filing of sponge, cotton or other material adapted to absorbing liquid hydrocarbon; and a wick projecting from an opening at the top. The record reveals a number of later patents, each primarily based on the principle of a shell or casing fluid, and a wick. One of these, patented in 1939 . . . and strikingly similar in shape and concept to [plaintiff's] idea, has a tapered shell containing a non-fibrous material for the absorption of such fluids as hydrocarbon oils, as well as a protruding wick. It is also noted that a competitive product similar to [defendant's] was on the market in 1961.

It is evident that the features of [plaintiff's] artificial candle which may also be found in the [defendant's] product are not so novel as to create the inference that the defendant utilized or copied the plaintiff's idea. . . .

From the evidence adduced at the time of trial, the court finds the following additional facts: Although [defendant's] research and development personnel had discussed gas fueled artificial candles over the years, the lack of dependable filler and burner valves precluded further planning. Liquid fueled candles were not deemed feasible by reason of the limited amount of fuel that could be stored. A gas lighter developed in 1948 or 1949, using throw away cartridges, was discontinued shortly thereafter because of the failure of the burner valve. In

> 1956, as the result of the efforts of a Swiss inventor . . . with whom . . . an employee of [defendant's] British branch, worked closely, suitable inlet and burner valves were perfected which enabled [defendant] to develop, at first, a Varaflame lighter and then products including the gas candle in question. The [plaintiff's] letter, which had been filed away, played no part in the development of the candle; and, in fact, was not seen again until after the institution of suit.

The concepts set forth in the above decision should be savored by the programmer. If you don't protect your procedures, let alone ultimate problem solving programs, others may appropriate them for a profit without compensating you, the inventor. As you well know, programs are easy to disguise. Procedures may be changed along with the sequence of steps, and data may be altered. However, Justice Brandeis expressed this warning more succinctly:

> To appropriate and use for profit, knowledge and ideas produced by other men, without making compensation or even acknowledgement may be inconsistent with the fine sense of propriety; but

> with the exceptions (under copyright and patent statutes) or in cases of special relationship "where the suit is based upon breach of contract or of trust or upon unfair competition" the law has heretofore sanctioned the practice.[104]

It is apparent that several factors can influence the degree of risk to any company accepting outside ideas. There are certain "tests" based on previous court decisions, that can be used as a guide in determining the kind of ideas or inventions which, when disclosed to a company, will not subject it to a successful suit for compensation. These are:

(1) Is the disclosure concrete and specific and not expressed in general undeveloped form? Vagueness and indefiniteness are ordinarily fatal to the submitter in the absence of an express contract.

(2) The chances of a submitter being successful in a court action are greatly decreased by lack of novelty in the disclosure.

(3) If the idea becomes public, as by public use or publication, through the act of the creator prior to use by the company, the company would not be liable thereafter even though it receives the idea in confidence before public use.

(4) If the company already has its own independently developed idea and uses that, it is not obligated to compensate an outside creator or

inventor even though the inventor gave the same idea in concrete form to the company prior to the use of the idea.[105]

You might wonder who usually wins in the event of a lawsuit, the inventor or the company? The answer really depends on the ability of the inventor to prove that the idea was his. That is why it is extremely important for the inventor, to (1) maintain dated laboratory notes, and (2) have them witnessed by someone who understands the invention. The notes should include the date of conception of the idea together with the date it was successfully tried out. From the inventor's standpoint his disclosure should be general and brief.

A number of companies have considered this problem carefully and have decided that with considerable precautions it is worth the risk to receive outside ideas. They have set up a procedure somewhat as follows:

(1) Personnel likely to receive such disclosures are instructed to send them immediately to a nontechnical administrative person, often in the company legal department, who has the responsibility for handling such disclosures. Any letters that are recognized in the mail as being disclosures are immediately forwarded to this administrative individual. So far as possible, such disclosures are systematically kept segregated from technical or engineering personnel until "ground rules" have been settled with the outside submitter.

(2) A waiver form is sent to the submitter and he is asked to sign and return it. This waiver form sets forth the basis on which the company will receive such disclosure. There are several essential conditions. First, the waiver negates a confidential relationship. Second, no commitment is made that the idea or material will be kept secret. Third, company does not agree to pay any compensation, but it gets no rights to the program under patent or copyright which may be issued to or owned by the inventor or creator. One drawback that I have found concerning the use of the waiver, is that inventors dislike terminology contained in waivers, principally because they do not understand it and, after having the terminology explained to them, they find the non-confidential relationship distasteful. In my experience most academicians would much prefer to have some relationship based upon trust rather than dealing with the company in a strictly businesslike manner.

Sometimes the inventor will vaguely inquire about the possibilities of an idea for accomplishing such and such a result. Such disclosures are easy to deal with. If he is asked to state simply what result or advantage he expects to get from his disclosure and what field of endeavor it relates to, the decision can quite often be made as to whether the company is interested without ever receiving a concrete disclosure. In any event the company can get the waiver signed prior to receiving any disclosure in detail.

One proposed solution is to have a completely independent consulting firm receive, process and screen disclosures, carry on any necessary correspondence, and then turn over the good ideas to the client company. There are consulting firms which offer to do this, but, of course, at a charge for the service.

Quite often a company has submitted to it in considerable detail an idea which it is already working on and planning to use at some future time. The question then arises as to whether, in turning down the submitted material, the company should disclose the fact that it already has the same material under study or in some stage of development. Perhaps as good a way as any of handling such situations is to include in the waiver a paragraph stating that the company is under no obligation to reveal information regarding its activities in the field to which the submitted idea pertains, even though the company has a similar idea under development.

Government Employees

Government employees in the programming field who write programs that may be protected by copyright, or invent programs that are patentable, are governed quite comprehensively by federal statute, executive orders and departmental regulations.

Patents

Presidential Executive Orders have, from 1950 through 1961, established a uniform government patent policy for inventions by government employees.

In essence, these executive orders have established a procedure whereby determination is first made by the government agency in which an invention originates and is then reviewed by the Patent Office, as to whether the government takes full right, title and interest in the invention, or only a nonexclusive, royalty free license, or no right at all, i. e, leaving full title with the employee. The Executive Orders further provide that the government shall take full title, except in certain instances, to inventions made "(1) during working hours, or (2) with a contribution by the government of facilities, equipment, material, funds or information, or of time or services of other government employees on official duty, or (3) which bear a direct relation to or are made in consequence of the official duties of the inventor."[106]

There are three principal ways in which the patent rights to an invention by a government employee are resolved under the provisions of Executive Orders now in effect:

(1) The government may obtain the entire right, title and interest in and to an invention,

(2) The government may reserve a non-exclusive, irrevocable, royalty free license in the invention with power to grant licenses for all governmental purposes, and

(3) The government shall grant the entire right, title and interest in and to the invention to the government employee.[107]

Equally important are provisions of federal statutes, implemented by departmental regulations, which restrict or prohibit employee activities in a conflict of interest situation. Both the federal statute and departmental regulations are punitive in nature. In essence the prohibition involved here forbids the receipt of compensation or other benefits from any source whatsoever for performance by the employee of his duties, and for which he is already entitled to receive government salary or compensation.[108]

Thus, the subject of patent rights to inventions by government employees does not present a serious problem of interpretation in the face of the Executive Orders' clear and unequivocal wording.

However, the right of a government employee to retain the proprietary interest (and the right to copyright) in a literary work, manuscript, writing or computer program is less clearly defined by federal statute or regulation.

Copyrights

During my tenure at the United States Air Force Academy, I have received numerous questions from my brethren on the faculty concerning their rights to copyright articles and other publications. The answers to these questions depend on a number of factors, as well as statutory and regulatory provisions. A portion of the federal statute provides as follows:

> No copyright shall subsist in the original text of any work which is in the public domain, or in any work which was published in this country prior to July 1, 1909, and has not already been copyrighted in the United States, or in any publication of the United States Government, or in any reprint, in whole or in part, thereof, except that the Postmaster General may secure copyright on behalf of the United States in whole or in any part of the publications authorized by . . . (federal law).[109]

One of the main controversies that has arisen during the Copyright Law Revision studies by Congress concerns published works produced by government officers and employees. A portion of the currently proposed Revision defines a "work of the United States Government," as a "work prepared by an employee or officer of the United States government as part of his official duties."[110] Thus, a government official or employee would not be prohibited from obtaining copyright protection for any work, writing or program he produces in his private capacity outside the scope of his official duties. The use of government time, material or facilities would be relevant but would not necessarily, of itself, determine whether something is a "work of the United States government." In that event, the government would then have the privilege of free use of the work, and any unauthorized use of government time, material, or facility, could subject an officer or employee to disciplinary action under departmental regulation.[111] In addition the conflict of interest prohibition would apply to such "works" in the same manner as the proscription concerning patents.

The phrase "publication of the United States" has been the subject of considerable debate and varied definition. Nowhere is "publication of the United States" defined. It may be taken to mean a work "published" by the government, regardless of ownership; a work authorized by the government, no matter by whom published; or a work both authored and published by the government. As a working definition, the Copyright Office interpreted the statute as denying copyright to works by government employees in the scope of their employment, no matter by whom published.[112]

It has been difficult to apply this definition in practice, particularly with respect to high officials whose duties are not subject to precise assignment by their superiors. For example, in 1958 the right of Admiral Rickover to copyright his speeches on education was examined by the courts.

In this case, Admiral Rickover delivered twenty-three speeches in public from 1955 to 1958. At that time he was a Vice-Admiral on active duty in the Navy Department as an Assistant Chief of the Bureau of Ships and an Assistant Director, United States Atomic Energy Commission. These speeches were written at home after normal working hours or while traveling. They were handwritten, and for the most part were typed by

Mrs. Rickover at home. The typewritten material, plus some handwritten portions, were typed in final form in the Admiral's office and multilithed on government duplicating machines. The speeches bear his rank and title, and were reproduced on paper stock used for press releases by the Department of Defense or the Atomic Energy Commission. Admiral Rickover had duties of supervision and inspection that could be carried out at or near the various points of delivery, and arrangements were made to present the speeches during free or "off-duty" hours. The Plaintiff, Public Affairs Associates, an Educational Publishing Organization, complained that the Defendant, Rickover, refused the Plaintiff the right to "use" or "publish" speeches Defendant had made "in his capacity as an Admiral." Plaintiff claimed the right to publish because Defendant "used the facilities, information and data obtained . . . in connection with his duties as a public official." Plaintiff further complained that the speeches resulted from "his official responsibilities" and therefore should be classified as "official publications of the United States Government." The Supreme Court of the United States disagreed with Plaintiff's claims, saying:

> It cannot be properly said that a government official who speaks or writes of matters with which he is concerned as an official is by the very fact of being such an official barred from a copyright on his

> productions. If they are statements called for by his official duties or explanations as guides for official actions, they are barred from copyright. A perusal even of the titles and delivery alone, should be sufficient to show these addresses were not government publications in that sense. The speeches themselves bear out this statement. We hold that none of these papers is a governmental publication.[113]

The court distinguished the circumstances in the Rickover case from those in Sawyer v. Crowell Publishing Company.[114] In that case, the court dealt with a map produced by government employees in the course of their duties, copyrighted by an employee, and then published by the government with notice of copyright registration. The court held that as the map "relates directly to the subject matter of Plaintiff's work" and was printed and engraved by the government, the employee's attempted copyright was invalid and inured to the employer's benefit.[115]

Similarly, the right of academicians, whether employed by the Government or a private institution, to copyright and retain a proprietary interest in their works, including lecture notes and manuscripts, has been well defined by the courts.

In a 1929 case, Sherill v. Grieves, the plaintiff, Captain Sherill, was an instructor in military sketching, map reading and surveying at the Army Post-Graduate School at Fort Leavenworth. Because no suitable text existed, he prepared material for a textbook in his leisure time. Before the book was published commercially, he gave permission for the portion relating to military sketching to be printed in pamphlet form by the Fort Leavenworth Press in sufficient numbers to provide copies for the students at the school. The pamphlet was printed with copyright notice, and a claim for copyright was registered by the plaintiff. The same material was later published as part of a book, also copyrighted by the plaintiff. The defendant infringer argued that the work was a publication of the United States Government and, consequently not entitled to copyright. In holding that the copyright was owned by the plaintiff, the court stated:

> The plaintiff at the time was employed to give instruction just as a professor in a private institution of learning is employed. The court does not know of any authority holding that such a professor is obliged to reduce his lectures to writing or if he does so that they become the property of the institution employing him.[116]

The Court then disposed of the contention made by Grieve's publishers that "the public" had already "paid" for Sherill's material saying:

> This contention is in substance that by entering the employment of the government a person sells all his energies, physical and mental to the government if they relate to any subject matter dealt with by him in performing his duties. . . . The fact is that officers do write such books which are copyrighted and used in government schools with the approval of the military establishment and such books are found in libraries of those establishments. . . .[117]

In summary, officers and employees of the government are entitled to copyright and retain the proprietary interest in, the works they produce on their own initiative and time and not as a part of their officially assigned duties even though the work is printed or published by the government and bears some relations to those duties.[118] It is also important to emphasize that contributions by the government (i. e., printing or other facilities) to the production of such works generally are disregarded by the above precedents in determining literary property rights. However, if there are government contributions, then the government is entitled to a royalty free license to use such material for governmental purposes.[119]

The government programmer should, in order to insure that he may retain his proprietary interest or ownership of his program, write it entirely while he is in an off-duty status and not on government time. Secondly, he should avoid using any government facilities, material or even secretarial assistance in order to avoid having to give the government free use of the product. In doing so he will also free himself from any appearance of conflict of interest.

CHAPTER VI

COPYRIGHT AND THE PROGRAMMER

On May 19, 1964, the United States Copyright Office announced that it would consider registration of computer programs as a "book" in Class A if:

(1) the elements of assembling, selecting, arranging, editing, and literary expression that went into the preparation (*sic*) of the program are sufficient to constitute original authorship;

(2) the program has been published, with the required copyright notice; that is, "copies" (i. e., reproductions of the program in a form perceptible or capable of being made perceptible to the human eye) bearing the notice have been distributed or made available to the public;

(3) the copies deposited for registration consist of or include reproductions in a language intelligible to human beings. If the only publication was in a form that cannot be perceived visually or read, something more (e. g., a printout of the entire program) would also have to be deposited.[120]

It should be emphasized that the announced policy of the copyright office would not result in protection to the programmer with respect to the idea or system utilized in preparing the program. Copyright in the program merely protects the owner against unauthorized copying of that particular program. If any other programmer created a program to achieve the same purpose and does so without access to and copying of the copyrighted program, there would be no copyright violation even if the second programmer ultimately produced a program which was identical to the first. This illustrates the concept of originality on which copyright law is based, which is of course different from and unrelated to the novelty concept of patent law.

It should also be pointed out that the Copyright Office possesses no jurisdiction with respect to the extent of copyright protection, what constitutes an infringement, or other problems that may present themselves as a practical matter to those involved in seeking protection for such works. In other words the decision by the Copyright Office that computer programs are eligible for copyright registration is by no means determinitive of the scope of protection of copyright. The ultimate determination of these questions is one for the courts.[121]

Fundamental to the adoption of the policy of accepting computer programs for registration by the Copyright Office, is the premise that a program is a set of instructions. The thoughts expressed in the instructions, whether in the form of a flow chart or in computer language, would seem to be clearly "writings" of an author. The fact that the instructions may be embodied in the form of alphanumerics would not remove the expressed thoughts from the category of "writings." Even though a relatively few individuals could understand the meaning of this form of instruction, it would not seem to prevent alphanumerics from acquiring the status of "writings."[122]

When computer language is "translated" into punch card form, the question arises whether the card with the series of punched holes is a "writing" in the same sense as the written form of computer language mentioned above. Additionally, the punched cards serve to "translate" or "assemble" the previously prepared instructions into language more easily readable by the machine. Magnetic impulses record information on tape in the form of "bits," several hundred to the inch. In this form the information is machine-readable and presents the greatest doubt as to the copyright protection that may be afforded a program.[123]

Punch cards could be construed as language intelligible to human beings (see paragraph (2) of the announced policy, supra), since they could be "read" by one familiar with the underlying pattern of the punched holes. In addition, the cards and the tape are susceptible to being read since their manipulation in a computer could be made to produce a "printout" of the information contained on the cards or tape. I might point out in passing that for many years a computer program was distinguishable from an audio tape which was not registerable with the Copyright Office. An audio tape does not constitute a written or printed record (e.g., of a musical composition) in an intelligible language and audio tapes are not susceptible of producing the equivalent of a "printout," which can be physically perceived.[124]

Thus, the computer program, as far as classification for registration is concerned, is similar to a "book," in that it contains a series of instructions relating to the operation of a computer to achieve a particular result. Considered as a "book," the Copyright Office must ascertain that the work was duly "published" before it may approve registration, in as much as the law contains no provisions for the registration of "unpublished" books. The application form (see appendix A) for a "book" includes an affidavit required by the statute indicating that the "book" was manufactured in the United States and that it was "published" on a specified date. The copyright claimant of a computer program would have to determine, as do other claimants, when his work was published, and include this date in the affidavit. Publication might constitute a very practical problem for the computer programmer unless publication took the form of a reproduction of the complete "printout" in a periodical. Federal statute does not define the term "publication." The statute does refer to the date of publication as "the earliest date when copies of the first authorized edition were placed on sale, sold or publicly distributed. . . ."[125] Yet this phrase does not define publication itself, but merely fixes the date when the copyright term (presently 56 years, including renewal) begins to run. In order to determine the scope and nature of the concept of publication it is necessary to consult the decisions of the courts which are not always consistent. These decisions seem to indicate that publication occurs when by consent of the copyright owner, the original or tangible copies of a work are sold, leased, loaned, or otherwise made available to the general public, or when an authorized offer is made to dispose of the work in any such manner even if a sale or other such disposition does not in fact occur. These terms contemplate that the owner of the program would receive some monetary gain from the sale of his program. However it is not necessary to receive compensation since publication also includes gifts to the public. Yet, it might be much easier to establish a sale of a program rather than a gift.[126] This concept of publication would, in my opinion, prove quite workable when applied to programs which are exploited through the distribution of "printouts."

I cannot over-emphasize the absolute necessity of affixing the statutory notice of copyright to the program. The notice at the beginning of the computer program, for example, would serve to notify the user, by means of its inclusion on the "printout," of the existence of a claim of copyright. This could be accomplished by affixing the statutory notice on the header card if a card deck is used. Another possibility would be the affixation of a notice, in the English language at the beginning of the reel of tape so that it would be clearly visible to anyone handling the tape.

Providing the above requirements are met, I see no difficulty in obtaining registration of an application program. However for those who submit an operating systems program for registration there is an obstacle that might impede registration. This impediment is based upon a legal principle which the courts have followed over the years (frequently without independent analysis of the problem). The concept of this proscription is that copyright does not exist in an object which serves as an integral part of the mechanical elements of an instrument or device. If the function of a work was utility of use, its protection, if any, must be sought under the patent law, but if it purported to communicate information, then copyright protection was appropriate. The reasoning behind this doctrine is that it would constitute a fraud upon the public to grant the extensive monopoly of the patent law where no examination of its novelty had been conducted.[127]

However, one may question whether such a principle is properly applicable to the systems program. The latter is not an integral part of a computer in the sense that the computer is of no beneficial use without the particular systems program in question. Computers may be initially programmed to accomplish different results. Other programs may be utilized in the computer even though the particular systems program is not used. Possibly we can draw an analogy between the systems program and a motion picture film, which functions by means of a mechanical device--the projector. The film itself is not considered an integral part of the machine. Additionally, the systems program is like the operational program, essentially a set of instructions, and certainly its aim is to communicate thoughts, to explain or instruct.[128]

Therefore, I do not believe the above argument presents a significant obstacle to securing a valid copyright (including registration with the U. S. Copyright Office) of a systems program.

However, there is another, parallel argument which might present an obstacle to securing the scope of protection which would make such a copyright truly meaningful. The question is, would the unauthorized use of a copyrighted program to control a computer be an infringement of copyright? To pose the question differently, when the purpose of placing the copyrighted material into the computer is solely to obtain functional results, namely, the operation of the machine, does this constitute an infringement of the copyrighted material?

Keep in mind that the copyright owner has the exclusive right to translate the copyrighted work or make any other version of it. On the face of it, it would appear that the translation of a program from a flow chart to a computer language or from a computer language to another computer language would constitute an infringement; and likewise the translation from a computer language into machine readable form.

However, there may well be a distinction between such a translation made as a step preparatory to actual use of the program in a computer and such translation made, for example, as incident to making an unauthorized sale of a tape to a third party. Generally, the scope of protection afforded a copyrighted work has usually been limited by the use for which the work is intended. One of the most notable examples is an architectual plan. An architect can copyright his plans, and he can then prevent others from making copies of them, though he cannot prevent others from using the ideas, which were contained in those plans.[129] Suppose someone takes the copyrighted plans of an architect and, without making any copies of the plans, builds a house in accordance with them. Is that house an infringement? Court decisions have held it is not.[130]

The point at issue is just this distinction--that the plans as long as they are used to explain the art to the public are protected by copyright, but the copyright cannot be extended to cover the practice of the art explained in the copyrighted material. Those that make the above distinction would attempt to apply the same concept to the programming field. This concept is based on a weary-worn legal principle that denies copyright protection to "systems," and is derived from the 1879 Supreme Court decision, Baker v. Selden.[131] The interpretation given this decision is that there is a distinction between things that are explanatory and things that are structural (functional). Insofar as something is explicative, it is properly copyrightable, and copyright protection is afforded. Insofar as something is functional, it is properly patentable, and patent protection is afforded. But copyright cannot extend to cover functional aspects and patent cannot extend to cover explanatory aspects.[132] Of course, here we are primarily concerned with only one side of the question, namely: what are the limits of copyright protection as applied to something that is functional, or a system?

At the outset, I can find nothing in the copyright law to support the argument that the use of a program in a computer bars it from copyright registration or protection. In fact I am highly persuaded that the unauthorized use of a copyrighted computer program to control a computer can constitute an infringement.[133] I do not agree that the above mentioned theory, based on a ninety year old Supreme Court decision, which has been subject to varied interpretation, is applicable to the contemporary economics and technology of computer programming. I prefer the view that protection under copyright should be "coextensive not only with the invention, but with the possibility of reproducing the result which gives to the invention its meaning and worth."[134]

Furthermore I might also mention that the court decisions used by those who advance the above argument, are decisions which have long been rejected in the light of the expanded extent of protection which Congress and the courts now afford to copyrighted works.

There are other aspects regarding computer usage which fall within the realm of the Constitutional provision and hence of the patent and copyright laws. One aspect relates to the printed output of the computer. Another relates to the means and methods of manipulating information within a computer to produce that output. A third relates to the data fed to the computer, the raw material upon which it performs its work to produce the output.

One might ask, which acts, if any, of those performed in the operation of a computer would constitute copyright infringement if the data used previously had been copyrighted?

As we know computers utilize punched cards, punched tape, magnetic tape, magnetic disks, and printed material for input and produce such materials as output.

Certain of these records are only machine readable. They are not eye readable except with great difficulty. They cannot produce sound in a phonograph for instruction. All they can do is transmit information pulses from one part of an electronic brain to another. Machine readable records in the sense of computer technology, are very different fron stenographer's notes, motion pictures and video tape. Yet many copyright owners and publishers have been concerned about the prospect that the future sales of their printed works may be reduced if they are recorded on magnetic tape or other machine-readable form because machines are capable of reproducing those works automatically. To stop such unfair use, they propose to enact a law that would make it illegal to record a copyrighted work in machine-readable form. They forget that such a law would also block use which would be fair but for the fact that a computer is used.[135] The proposal to grant the copyright owner the right to exclude recording of material at the input of the computer instead of only at the output may be short-sighted economically and adverse to the interests of publishers, writers and other authors.

We should also consider use that involves indexing, citation, analysis, partial quotation, abstracting, or duplication. Here the principle issue is whether mechanical duplication of a copyrighted computer program other than in printed form, constitutes infringement, if the duplicate is not primarily intended to be used in certain prohibited instances for commercial or financial gain.

As one might well imagine the problem of computer uses of copyrighted material such as I have mentioned, has attracted increasing attention and controversy during the past few years. The Congressional committee responsible for the general copyright law revision which is now pending in Congress, held many hearings at which testimony was obtained from members of the copyright bar, patent bar, publishers, authors, educators and scholars. From the hearings and the testimony taken, the Congressional committee recognized the profound impact that information storage and retrieval devices seemed destined to have on authorship, communcations, and the future of the computer industry; yet the committee was also aware of the dangers of legislating prematurely in this area of exploding technology.

Instead of trying to deal explicitly with computer usages the recommendation of the committee was, that the statute should be general in terms and broad enough to allow for adjustment to future changes in patterns of reproduction and other uses of literary works including computer programs.

Thus, with certain exceptions, the committee believed that the following computer uses could be infringements of copyright under the currently proposed revision of the law: reproduction of a work (or a substantial part of it) in any tangible form (paper, punch cards, magnetic tape, etc.) for input into an information storage and retrieval system; reproduction of a work or substantial parts of it, in copies as the "printout" or output of the computer; preparation for input of an index or abstract of the work so complete and detailed that it would be considered a "derivative work" (usually defined as a compilation or abridgment, an adaptation, a translation, or other version of the work); computer transmission or display of a visual image of a work to one or more members of the public. On the other hand, since the mere scanning or manipulation of the contents of a work within the system would not involve a reproduction, a preparation of a derivative work, or a public distribution, performance, or display, it would be outside the scope of the legislation and not constitute an infringement of copyright.[136]

It has been argued on behalf of those interested in fostering broader computer uses, that the copyright is not damaged by input alone, and that the development of computer technology calls for unrestricted availability of unlimited quantities of copyrighted material for introduction into information systems. They point out that copyright protects only "literary and scientific" works in their physical form, not in the abstract, as copyright owners and publishers contend. These proponents of more unlimited use do not believe that the proposed revision of the copyright law now before congress would prevent the purchaser of a book "from storing its contents in a computer without permission of the copyright owner." While acknowledging consent should be obtained for output and possibly for some other computer uses, these interests recommended at least a partial exemption in cases of reproduction for input.

On the other side, the copyright owners and publishers have stressed that computers have the potential, and in some cases, the present capacity to destroy the entire market of authors and publishers. They consider it indispensible that reproduction for input, with certain recognized exceptions, requires the consent of the copyright owner, on the ground that this is the only point in computer operations at which copyright control can be exercised; they argue that the mere presence of an electronic reproduction in a machine could deprive a publisher of a substantial market for printed copies, and that if input were exempted there would likewise be no market for machine-readable copies.[137]

As the controversy rages there have been proposals for establishing both voluntary and compulsory licensing systems for computer uses particularly at the input state, and it has been suggested that a commission be established to study the problems and recommend definitive copyright legislation subsequent to the enactment of the currently proposed revision of the copyright law. Provision was made for the appointment of a commision in the currently proposed revision, and I will discuss it in more detail in Chapter VIII.

In the interim, the Congressional committee made it quite clear that under the provisions of the currently proposed revision of the copyright law, the exclusive rights of the copyright owner would be preserved with respect to reproductions of his work for input or storage in an information system.

It should be emphasized that the interpretation by the Congressional committee concerning the effect of the currently proposed revision, is certainly not determinative of the status of the various conflicting interests involved. No more so than are the opinions of the proponents of unrestricted availability of unlimited quantities of copyrighted material for introduction into information systems, or the opinions of the copyright owners or publishers. The ultimate determination of these questions will have to be resolved by the courts in test cases that are presented to them. At the same time, I should mention the fact that many times the courts examine the legislative intent of the Congress where an interpretation of Federal statute is involved.

Based upon my own research I am highly persuaded that Section 1(c) of the Copyright Act includes amendments that extend copyright protection to all nondramatic literary works and also grant to the copyright owners of such works the exclusive right to make or procure the making of any record or transcription thereof from which the work can, in any manner be exhibited, delivered, presented, produced or reproduced.[138] In view of these 1952 amendments, I believe the authority of the Corcoran case over rights in copyrighted nondramatic works today is questionable. Instead, on the basis of the present wording of Subsection 1(c), I believe it can logically be argued that any unauthorized input of copyrighted nondramatic material into a computer constitutes the making of record within the intent of Subsection 1(c) and therefore is a violation of rights granted to copyright owners by that subsection.[139] The foregoing are, of course, my own views. I know of no cases involving computer input of copyrighted nondramatic material or holding such input to be a violation of 1(c) if done without the authority of the copyright owner.[140] The making of a completed printed copy of a copyrighted work by means of a computer is clearly forbidden by Section 1(a), Copyright Law and the proposed revisions thereof. In this case the computer output constitutes an infringing copy. But even here an exception might arise if the sole purpose for printing the copy is to make sure that the original work has been accurately recorded in machine readable form within the computer so that it can be indexed, cited, analyzed and quoted.[141]

Assuming the judgment of the Copyright Office on the applicability of the copyright law to computer programs ultimately stands up, one major problem remains. That is, the scope of copyright protection is not well defined. The courts are going to have to consider the cases dealing with copyrighting mathematics and unique equations, as well as cases dealing with books of instructions, etc., and try to apply established rules to this new area.

In 1968, Congress passed the Standard Reference Data Act, providing for the collection, compilation, critical evaluation, publication and sale of standard reference data.[142] The Act authorizes and directs the Secretary of Commerce to compile and disseminate standard reference data on behalf of the government.[143]

Most significant is the explicit Congressional recognition that the data will be disseminated in large part in the form of computer programs and data files embodied in computer tapes.[144] Congress intended that compilations of data would be "published" in various forms, including decks of punched cards, magnetic tapes, microfiche, as well as other forms.[145] A significant portion of the standard reference data is now being disseminated on computer tapes, and the bulk of it will soon be disseminated in that manner. It is clearly the intent of Congress to protect such material on copyright principles.[146]

While the enactment of the Standard Reference Data Act is not a legislative determination on the broad policy question of protection of computer programs, nonetheless, the Act clearly indicates a Congressional determination that the principles of copyright law apply to protect at least the government's programs. In fact, it appears that Congress intended that the government's programs and data bases would be protected under the identical principles of copyright protection which it has interpreted copyright law to give to private authors.

CHAPTER VII

PATENTABILITY OF COMPUTER PROGRAMS

The Patent System added the fuel of interest to the fire of genius.

Abraham Lincoln

Prior to 1968 the Patent Office consistently refused to issue patents for computer programs. This position was entirely consistent with certain sections of the currently proposed revision of the patent law which declare programs to be unpatentable.[147]

It should be emphasized that the overall issue was not the patentability of computer programs as such. Rather the question has involved the patentability of processes carried out in response to programmed instructions in a computer, and the patentability of apparatus configurations resulting from the execution of programmed instructions in the computer. The distinction is important since it is often desirable to include in the patent application a description of the invention that is sufficiently broad to encompass processes and apparatus but independent of the general purpose computer, i.e., on wired-circuit implementations. Admittedly, the cost of digital circuitry is continually decreasing, and the cost of programming is increasing.

The basis for the previous policy in the Patent Office was in part due to the premise that programs were not patentable "processes," as defined by statute, but were purely "mental steps." "Mental steps" include: calculating, comparing, determining, registering, counting, observing, measuring, recording, and computing, and which either involve the human being as the sole means of carrying out such mental steps or processes, or at least encompass some degree of human intervention.[148]

However, this position, adherred to by the Patent Office for so many years, was overruled by several decisions of the Court of Customs and Patent Appeals beginning on June 27, 1968. I am quite certain that these decisions will have a forceful effect on the proposed revisions of the patent law which are inconsistent with these decisions.

While I have tried to avoid subjecting the reader to the shrouds of legal terminology in these pages, in order to adequately explain the rather complex patent system as it relates to programs, I believe it is essential to mention these decisions briefly.

The first case, entitled In the Matter of the Application of (in re) Tarczy-Hornoch, was decided June 27, 1968 (397 F. 2d 856). This case involved an application for a patent on a process (program). The description in the patent application included a claim which had been rejected by the Patent Office because the process could be carried out only with the disclosed apparatus (hardware). One of the important facets of the court's decision was its discussion of the term "process." The court said, "it is when the term process is used to represent the means or method of producing a result that it is patentable, and it will include all methods or means which are not effected by mechanism or mechanical combinations. But the term process is often used in a more vague sense, in which it cannot be the subject of a patent. Thus we say that a board is undergoing the process of being planed, grain of being ground, iron of being hammered, or rolled. Here the term is used subjectively or passively as applied to the material operated on, and not to the method or mode of producing that operation, which is, by mechanical means, or the use of machines."

In upholding the application for a patent on a computer program the court said that if the operation performed by the machine is new in reference to the object upon which it is employed, a new process has been invented.

On the other hand, if the operation is known in reference to the object, the invention of a new machine for performing it does not make a new process, but only a new instrument for applying it.

In re Prater and Wei, decided November 20, 1968, (415 F. 2d 1378. This case involved an application for a patent for a computer program and described a process to be performed on an analog computer. The novelty of the invention was established by the fact that minimum error occurred when using that set of spectrographic data producing the largest determinant for the corresponding system of simultaneous linear equations. The invention was directed at the method of making spectrographic analysis.

The Court decided that a process disclosed as being a sequence or a combination of steps, capable of being performed without human intervention, and directed to an industrial technology, was a "useful art" within the scope of Art I, Section 8, Clause 8 of the Constitution. The Court further determined that issuance of a Patent should not be denied merely because the process could alternately be carried out by mental steps. This invention encompassed the reduction of data from spectral analysis of gas mixtures.

The Patent Office petitioned the court to reconsider the matter on the grounds that the constitutional aspects had not been adequately considered. A rehearing on application of the Patent Office was granted on August 14, 1969 (415 F. 2d 1393).

In the rehearing the Court stated, as to the process claims, that the mere disclosure of apparatus for performing the steps does not necessarily avoid the "mental step" doctrine. Since applicants had admitted that the process claims apart from the disclosure were broad enough to include mental implementation or human intervention (mental steps), the Court overruled its former decision in the first Prater case. However, in reaching its decision the Court made it clear that the mental step doctrine was now necessarily an inherent obstacle to the patentability of computer programs. The Court also observed:

> No reason is now apparent why based on the Constitution, statute, or case law, apparatus and process claims (detailed definitions and descriptions of how the invention works) broad enough to encompass

> the operation of a programmed general-purpose digital computer are necessarily unpatentable. In one sense a general-purpose digital computer may be regarded as but a storeroom of parts and/or electrical components. But once a program has been introduced, the general-purpose digital computer becomes a special-purpose digital computer (i.e., a specific electrical circuit with or without electro-mechanical components) which along with the processes by which it operates, may be patented, subject to the requirements of novelty, utility and nonobviousness. Based on the present law we see no other reasonable conclusion.

The above language represents a viewpoint of the court directly contrary to the position previously subscribed to by the Patent Office. The language of the two Prater decisions represents a turning point in the development of the patent law as it pertains to the area of digital computer programming.

In re Bernhart, decided November 20, 1969 (417 F. 2d 1395).

> The disclosure included in the patent application provides equations definitive of the geometric relationships between the three-dimensional coordinates to each point of interest and the corresponding two-dimensional coordinates which determine the location of that point on a planar portrayal or

drawing to be made. The disclosure then teaches (explains) that the original data on point positions and connecting lines can be written in a form acceptable as input to a general purpose digital computer; that the equations disclosed in the application can be used to control the operation of the computer on the input data, i. e., the equations can be programmed into the computer; that an operator can select particular values for certain terms in the programmed equations, thereby determining the kind of portrayal to be produced; that the computer output will be a sequence of signals representative of the locations of points on the desired portrayal; and that those signals can be used to control the operation of a plotting machine which will produce the desired view of the object on paper.

Applicants concede that they did not invent the computer or the plotting machine. Nor do they claim any special method of feeding input data on point positions into the computer. Most importantly they do not claim as their invention merely a set of equations even though, as we will see later, those equations were not known in the prior art. In rejecting the applicant's claims the examiner contended that since applicants had merely set forth equations and asserted that the equations could be readily programmed by programmers of ordinary skill, they had not set forth how the automatic equipment of their invention was to be made but merely invited programmers to solve applicant's problems. The Board of Appeals (within the Patent Office) reversed this rejection, noting that the statute required only enough information in the disclosure to enable persons of ordinary skill to practice the invention. The board recognized that applicant's equations could be readily programmed into the computer by those skilled in programming, and held that the disclosure was therefore sufficient.

The apparatus claims were rejected because the examiner said that it was "old" to combine a programmed digital computer with a plotting device. The examiner indicated that the novelty in applicant's claims therefore lay in the equations with which the computer was programmed, and that this was not a

> *structural* difference over the prior art. The examiner concluded that since the programming was not structural, the claims were predicated for patentability on mental steps. . . . The Patent Office has taken the position that if, in an invention defined by a claim, the novelty is indicated by an expression which does not itself fit into a statutory class (in this case not a machine or a part thereof), then the whole invention is non-statutory since all else in the claim is old in this case.

The court further stated:

> We do not believe this view is correct under the present case law. We believe that we should not penalize the inventor who makes his invention by discovering new and unobvious mathematical relationships which he then utilizes in a machine, as against the inventor who makes the *same machine* by trial and error and does not disclose the laws by which it operates. . . . The Patent Office has taken the position that the provision of new signals to be stored by the computer does not make it a new machine, i.e., it is *structurally* the same no matter how new, useful, and unobvious the result. We believe that if the machine is

programmed in a certain new and unobvious way, it is physically different from a machine without that program; its memory elements are differently arranged. If a new machine has not been invented, certainly a "new and useful improvement" of the unprogrammed machine has been.

Turning now to the method claim, it recites three steps: programming the computer to compute positions of planar axes, programming the computer to render an output representative of the coordinates of planar point positions, and applying the output of the computer to a plotting apparatus. . . . In the case before us, the disclosure shows only machinery for carrying out the portrayal process. In fact it is the chief object of the invention to eliminate the drudgery involved in a draftsman's making the desired portrayals.

We believe that a statutory process is disclosed. We further find that it in no way covers any mental steps but requires both a "digital computer" and a "planar plotting apparatus" to carry it out. We conclude that the method defined by this claim is statutory and its patentability must be judged in light of the prior art.

> As to the prior art, the examiner applied Taylor (U.S. patent filed February 23, 1960). Taylor's object was to partially automate the tedious process of making various kinds of drawings of three-dimensional objects. Applicant's object is to further automate the production of these drawings. Their invention does this in two ways: it adds the plotting machine at the output end of the computer, and it conditions the computer in a new way to perform the data transformations. The first addition alone would not have saved the invention from obviousness; however, the second addition, the new programming claimed, does make the invention as a whole unobvious.

The court thus has provided the theoretical basis for descriptions (claims) not only to the programmed process but to the programmed machine as apparatus for carrying out that process. Under the facts in the Bernhart case the court also decided that programmed steps are outside the "mental step" doctrine.

In re Mahoney, decided 26 Feb. 1970 (164 U.S.P.Q. 572, C.C.P.A.), was the next case to come before the court. The purported invention in this case related to a method for synchronizing a receiver which was receiving a stream of bits from a transmitter. According to the patent application, prior to this invention receivers were synchronized to transmitters by including certain synchronizing bits in the data string. Synchronization was obtained by interrogating all bits to determine which bits were synchronizing bits. The application in this case reversed the process and obtained synchronization by determining which bits were the data bits, thereby establishing that the remaining bits were the synchronizing bits. One of the claims under consideration was as follows:

> 19. The method of establishing which bits in a bit stream are data bits and which are framing bits, where the framing bits appear in predetermined positions and have a predetermined sequence of values, comprising the steps of:
>
> (1) comparing to one another the values of bits in respective bit positions in successive equal length groups of bits,
>
> (2) registering which respective positions in said groups of bits have a sequence of bit values inconsistent with said predetermined framing sequence as ascertained by repetitions of the comparing step, and
>
> (3) counting the number of successive bit positions in the bit stream wherein the sequence of bit values has been ascertained as inconsistent with the predetermined

> framing sequence, whereby the framing bit positions are established when the number of successive bit positions counted is equal to the total number between the framing bit positions.

The Court's rationale for allowing the claim included the following language:

> The words bit and bit stream as used in the claim . . . render mental performance of the claimed process impossible. . . . In computers bits appear in the physical form of pulses. . . . If the bits are in a bit stream, as required by the claims here and understood in the data transmission art, the bits must have the form of electrical pulses. . . . It would be absurd to say that the claims reasonably read on a mentally implemented process. We are aware of no way in which the human mind can operate on such signals.

In re Musgrave was decided 8 October 1970 (431 F. 2d 882, 167 U.S.P.Q. 280, C.C.P.A.). This case involved special purpose apparatus and a method for analyzing seismic data. The Patent Office had refused to allow the patent on the basis that the invention was mathematical in nature and therefore not subject to a patent monopoly. The Court reversed the

Patent Office on the basis that the inventor had developed a process which was in fact useful in "the technological arts."

> All that is necessary. . . to make a sequence of operational steps a statutory process. . . is that it be in the technological art.

The concurring opinion in this case quoted the above language and then stated that:

> No limitations are placed upon this holding. In effect it is apparent that what the majority has done will only substitute for one set of problems, another possibly more complex set. Because the problems will be new they will add confusion to the law. We are only now beginning to make some sense out of this area of the law. To change at this time, I submit is nonsense.

Possibly the final chapter in this drama is now pending in the Supreme Court of the United States.[149] In its petition the Patent Office questions whether "a method of converting numerical information from binary coded decimal numbers into true binary numbers, for use as an operational program in conventional general purpose digital computers, is patentable." The United States Court of Customs and Patent Appeals had answered this question affirmatively.[150] This case involved an application which stated that the method which sought patent protection could be carried out by hand by programming a general purpose computer or by special purpose apparatus. The method described in this patent application involves repeatedly adding the binary number "101" (appropriately shifted) to the binary coded "units" digit of the decimal number, once for each "1" in the "tens" digit.

The claim considered by the court was:

> 13. A data processing method for converting binary coded decimal number representations into binary number representations comprising the steps of:
>
> (1) testing each binary digit position i, beginning with the least significant binary digit position, of the most significant decimal digit representation for a binary "O" or a binary "1";
>
> (2) if a binary "O" is detected, repeating step (1) for the next least significant binary digit position of said most significant decimal digit representation;
>
> (3) if a binary "1" is detected, adding a binary "1" at the (i + 1)th and(i + 3)th least significant binary digit positions of the next lesser significant decimal digit representation, and repeating step (1) for the next least significant binary digit position of said most significant decimal digit representation;

> (4) upon exhausting the binary digit positions of said most significant decimal digit representation, repeating steps (1) through (3) for the next lesser significant decimal digit representation as modified by the previous execution of steps (1) through (3); and
>
> (5) repeating steps (1) through (4) until the second least significant decimal digit representation has been so processed.

In its petition before the Supreme Court, the Patent Office argues that no new machinery is necessary to complete the series of logical steps described in the disputed claims. "The mathematical procedures recited in /the/ claims can be carried out in existing computer inventions . . .; they can also be performed without a computer . . . ."

"The instant case" the Patent Office claims, "appears to be the last of a series of decisions by which the Court of Customs and Patent Appeals has eroded the long standing administrative and judicial doctrine, previously accepted by the court, that 'purely mental steps do not form a process which falls within the scope of patentability as defined by statute.'"[151]

Apart from the strictly legal considerations affecting patentability, the "decision below could also create enormous problems in the administration of the patent program," the petition states. "No adequate classification technique or research files exist," and, even if these were available, reliable searches would not be feasible because of the tremendous volume or prior art. "For this reason, it is doubtful that the criteria for examination of patent application . . . can be effectively applied to applications for patents on computer programs. Rather, under the instant decision, patents issued on such applications may be little more in fact than registration, which must await the test of infringement litigation. As stated in Graham v. John Deere, . . . , '[t]o await litigation is - for all practical purposes - to debilitate the patent system', 383 U.S. at 18."

It appears clear from the decisions discussed above that patent protection will be allowed in the field of computer programming. However, it remains necessary to reconcile this basic decision with the pre-existing "mental step" doctrine. If you recall, the Patent Office refused to issue patents for computer programs, and this policy was due in part to the premise that programs were not patentable "processes" but were purely "mental steps." "Mental steps" either involve the human being as the sole means of carrying out such "mental steps," or at least encompass some degree of human intervention. I believe the decisions have provided the programmer with intelligible guidance to protect him from the pitfalls of the "mental step" doctrine. It appears, for example, that a patent should not be issued when it contains descriptions (claims) that indicate that the process is dependent on emotional or aesthetic judgments of human beings.

In addition to these considerations we must also mention the practical problems of what form of disclosure is acceptable to the Patent Office and what language is most appropriate in the application. For example, it would appear adequate to disclose a program in terms of the flowchart and program listings normally used to exchange information between technical personnel.

Another interesting and important aspect of this problem is the fact that, although it now appears possible for people to obtain patents covering computer programs, no one can be certain whether or not these patents are, in fact, enforceable, and if they are enforceable, what scope they will be accorded.

In addition to the effect of these decisions on the Congress and the proposed revisions of the patent law, elements of the programming industry have been campaigning to have programs included as patentable material due to the belief that patent affords much more sweeping protection for proprietary programs than does copyright.[152] These efforts have borne fruit. In June 1970, Applied Data Research was granted a patent for its proprietary Autoflow package. Autoflow uses Cobol, Fortran, PL/1, and

Assembly languages to generate two-dimensional flowcharts. The patent covered 45 claims and protection pertains largely to the flowchart.[153] It would appear that the Patent Office has dropped its guidelines excluding software from patent protection, and will now consider patent applications for computer programs on the basis of the merits of the specific inventions sought to be protected rather than refuse consideration for reasons such as those discarded by the Court in the 2nd Prater and Wei decision.

In considering the possibility of using patents to protect programs, it seems that an important point which we should not lose sight of is the fact that irrespective of the outcome of the various cases, it is not going to be possible to obtain valid patents on some of the programs which are developed. The reason for this is simply that the great majority of programs do not contain the type of unobvious or inventive concepts which are necessary in order to obtain valid patents.[154]

Even though the law of patentability of computer programs must develop on a case by case basis, I believe that many computer programs will be unpatentable because they are obvious to a skilled programmer. Often programs designed to solve a particular problem on the basis of certain input data will be obvious to the average programmer. The creation of a new program which does not contain an unobvious concept still involves a substantial amount of investment. The patent system can adequately protect inventive concepts; however, the patent law does not have any means of protecting the investment which goes into developing noninventive innovations.

From a business point of view, one who is marketing computer programs needs protection for all of the programs that he markets, not for just a small percentage of them. When a businessman invests money in a marketable product, he wants to know that the results of that investment will be protected from misappropriation by others. Granted, most people are honest and will not misappropriate the fruits of another's labor. But, in today's environment, unless the businessman can be assured that he has some legal weapon to prevent the misappropriation of his products by even a few others, he will be reluctant to invest. And when a businessman invests in the development of programs he will find that only a very small percentage of the resulting work will be patentable.

A computer can do certain things no individual can do, because of the computer's rapidity and the brevity of life. On the other hand, there are things which no presently known computer can do.

The man who programs the computer, that is, gives instructions for a particular treatment of data, may be said to be the true creator of the end result, even though it is a result he cannot achieve himself. In some cases, the only creativity consists in the application of an existing program to a new body of data.

The program itself may be described in words or mathematical symbols. It is made a part of the machine by a variety of tangible devices. Whether the program more properly belongs in the area of patent than of copyright is still the subject of considerable controversy. To create monopolies of programs has some value in encouraging the creation of new material. But, where the public interest really lies has not been determined, in terms of duration and scope of rights.

CHAPTER VIII

THIRD GENERATION PROTECTION

From what we have seen in previous chapters it should be quite clear that computer programs are eligible for protection under principles of Copyright, Patent and Trade Secret. Yet, you might ask how effective is such protection? Let's first consider this question as it relates to Copyright.

Computer programs are represented at different times and in a number of different computer languages. The programmer might first write the instructions in a language designed to correspond closely with common English usage. These instructions then might be translated by the computer into one of several intermediate languages, comprehensible both to the machine and the programmer, and designed to facilitate communication between the two. Finally the computer will translate the programs into its own language, a form which it can read easily but which is almost unintelligible even to technically trained personnel. Because of the variable nature of computer programs and the ease by which they may be converted into a number of computer languages, it seems clear that copyright protection, in order to be effective, must safeguard programs from unauthorized translations even into other computer languages. If the statutory monopoly is construed strictly against the copyright holder and computer programs are denied protection against unauthorized translations, programmers will almost certainly seek separate copyrights in many languages and thus complicate administration of the copyright laws.

If programs are copyrighted on a wide scale, programmers will receive the financial rewards for their original creations and there will be an increase in publication and thus a greater dissemination of programming techniques. But, although, as we have seen, the procedural requirements for obtaining copyright are simple and inexpensive, the scope of copyright protection may be so limited and uncertain in application that programmers would hesitate to seek copyright.

Copyright protection would not seem to extend to techniques employed in writing the program or to its logical sequence of instructions, which constitutes the program's greatest value, but only to the program's format. But since programs are easy to disguise and their format inexpensive to alter, such a limited copyright would still permit a copier to legally produce a program similar in substance but quite different in appearance--for example, by changing procedures, the sequence of steps or by altering the data--at relatively little cost. Since copyright does not extend to the techniques used in formulating a program, program producers may be reluctant to obtain protection only for the program's formal expression.

There are additional weaknesses in copyright protection which might discourage its use by producers. The copyright requirement of publication would give the potential infringers easy access to the program. And detection of the infringers may be exceedingly difficult for, in addition to the fact that programs can be easily disguised, they may often be copies for use solely by the plagiarizer rather than for resale.

Patent

Whereas copyright grants only a limited monopoly on the form of expression, patent is designed to protect novel ideas and inventions. A patent on a program would make it unlawful for anyone without the authorization of the patentee to make, use, or sell the invention. The ideas and techniques embodied in the program would be covered; independent creation of the same program would likewise be prohibited. This is not true of copyright protection. As a consequence, it would seem that program producers would be willing to have their programs patented, and to the extent that they were patentable, proprietary programs would be protected and new techniques publicized.

Allowing programs to be patented may have serious detrimental consequences for the industry. Instead of simply drawing up a proprietary program upon a customer's order, as can now be done, a programmer would have to conduct a patent search to discover what techniques he could use without permission and payment. Upon finding that a technique had been patented he would have to obtain clearance from the patent owner, even if the particular techniques were of slight use to him. Moreover, he would be induced to invent around any patent obstacles, thereby adding to the expense of programming and increasing the danger that inefficient programs would come into use.

Trade Secrets

One of the most important functions of the law of Trade Secrets is the interim protection it provides the inventor who has filed a patent application but has not been issued a patent. Currently this would involve a waiting period of 18-24 months. Protection during this interim period would be very important to the programmers for many programs have a useful life which is actually shorter than the waiting period.

Although recent decisions of the Federal Courts have cast some doubt on the effectiveness of trade secret law in the spectrum of protection provided by the Patent laws, I believe this could be resolved by the Congress with the passage of the "Unfair Competition Act" as well as the new Patent Act.[155]

Previously, lawsuits based on unfair competition (breach of Trade Secrets) had to be brought in the state courts. There has been no federal law protecting trade secrets.

The federal "Unfair Competition Act" will provide in part, "Any person who shall engage in any act, trade practice, or course of conduct, in commerce, which . . . (3) results or is likely to result in the wrongful disclosure or misappropriation of a trade secret or confidential information . . . shall be liable in a civil action for unfair competition." Section 43(c) of this proposed bill states, "The relief provided for by this Act shall be in addition to and shall not affect those remedies otherwise available . . . pursuant to the statutes of the United States (including patent and copyright statutes)."

As I have indicated, it is not clear whether or not the law of Trade Secrets conflicts with the federal patent policy.[156] Even if the Supreme Court tells us that such is the case, Congress has the option of explicitly clarifying that policy and thereby clearing the air for the lawyers and more importantly for the programmers.[157]

In addition to the suggested alternative by the proponents of trade secret protection, at least one proposal has been advanced which would safeguard computer programs in lieu of protection by copyright or patent. This proposal was submitted by IBM corporation to the Commissioner of Patents and was published in the Official Gazette (an official publication of the Patent Office) October 16, 1968.[158]

This submission was based on the premise that although attempts have been made to use the existing systems of patents, copyrights, and trade secrets, in order to gain legal protection for computer programs, the field of computer programming has certain characteristics that differentiate it from the creativity and inventiveness that currently fall within the scope of existing systems. The report pointed out that the law relative to the protection of computer programs was just developing and that it would be advantageous if the law could develop through the enactment of a well-thought-out legislation aimed at solving the problem properly.

Generally, the IBM report proposed a registration system which would provide protection for the investment involved in creating a workable program rather than for the discovery of new concepts or new principles.

Under the proposed system a registered program could not be copied, executed, translated, etc. without the owner's authorization.

At the time of registration a copy of the program itself and a description of the concepts used in the program would be deposited with the registrar. At the option of the party who is registering the program, a detailed description of the program (e.g., detailed flowcharts, etc.) may also be deposited if the owner wanted to gain protection for this material. The registrar would maintain the program physically, and the detailed description in secrecy until the end of the period of protection, but he would make public the description of the concepts. A person who registered a program might attempt to keep the program secret or he might divulge the program to any extent that he desired. The only examination required at the time of registration would be a determination that the format of the description of the concepts was the proper form.

Unauthorized copy, translation, use or transfer of physical possession of a registered program or of the registered detailed description would subject one to legal liability. No liability would be incurred under this system by one who used the published conceptual description to independently create a new program.

The proposal did not suggest any changes in the patent system. Thus, the patent system would continue to exist in its present form. If someone believed he had developed a patentable concept, he could still seek patent protection for that concept. He could, if he desired, also register the detailed program, providing he disclosed the concept for which the patent protection had been requested. However, the system being proposed provides a viable alternative for those seeking to protect computer programs, most of which do not involve unobvious concepts.[159]

While the controversy continues regarding the various methods of protection, what is industry doing to physically safeguard computer information? Are the programmer and the computer scientist worried, but ineffectual in the protection of their creativity? As a matter of fact they are not.

For example, academicians and professionals in the programming field are well aware that meaningful computer programs are really never complete at any fixed point in time. One method utilized by these people is that of "updating," which is a valid, inexpensive and self-operating method of protecting large scale programs from misappropriation.

Software houses, as well as manufacturers of hardware, are well aware that proprietary information in computer systems, in-plant or out, is highly vulnerable to industrial espionage. There are protective measures that, if applied to computers, terminal stations, and communication lines, should minimize the opportunity for theft or loss of sensitive data.

Such a loss hurts. For example, in 1969, a large airline company "lost" information valued at over $5 million. The irony of it was that this information detailed "how the airline intended to operate its $96 million computer system to make the company more competitive."

Time-sharing systems that depend on public telephone and telegraph lines are especially vulnerable to espionage. In fact, without extensive precautions these systems are open invitations to sharp shooting spies.[160]

Complicating the security picture is the astronomical growth in time-sharing since 1965. Each year more and more data is accumulated, processed, stored and retrieved by: local, state, and federal agencies; universities; "think tanks;" trade associations; labor unions; hospitals and credit bureaus.

One of the most common security measures is the use of pass words and identification codes. It may be wise to use a sequence of passwords and require a different password for each use. Passwords and identification codes should be changed often. Both the authorized user and the terminal require identification.

A computer may be programmed to check the validity of passwords and identification codes before it receives or prints out information; the user should be able to key in his password without a printout of it appearing on the terminal or on the computer output. Preferably, the password should consist of numbers, letters, and symbols. Passwords, names and identifications should not be given out over the telephone.

Access to the computer should be recorded and audited as a part of managerial, administrative and procedural protection, as well as limiting access to the library and computer room, which should not be a showplace for visitors and unauthorized employees. Access can be monitored by closed circuit TV.

The computer should be programmed to keep a log, recording the files used, the user's identification, and all inquiries. The log should be audited periodically to uncover questionable inquiries and penetrations.

Of course, no matter how elaborate, ironclad, and costly a security system is, it will be no better than the integrity of the computer personnel. For that reason, programmers, operators and maintenance technicians as well as systems analysts should be subjected to stringent screening before hiring, and they should be bonded.

Data files, disks, and tapes should be stored in locked areas; a log of users should be kept and it should be audited periodically.

A need to know status should be assigned to qualified personnel. Waste basket contents and tele-typewriter ribbons should be destroyed as well as carbon papers bearing sensitive information.

Programmers should not be allowed to modify programs running on the computer; program changes should be approved and signed off by someone of managerial status.[161]

In Chapter V we discussed another method of safeguarding computer information and that involved contractual protection. This is achieved by having computer personnel sign a non-disclosure employment contract. Additionally, before programs are loaned to outsiders they should sign a non-disclosure agreement.

Other companies have experienced difficulties peculiar to their own type of service and have attempted to provide protection accordingly. One company whose primary business is leasing magnetic tapes, delivers by tape and live transmission. Individual contracts are negotiated with each user. Of course, as technology advances protection becomes more difficult. Specifically, the recent growth of time-sharing system , has introduced a third party in some arrangements. According to company policy, although no part of the data base is copyrighted, the parameters by which it operates are.

Some companies have similar difficulties, particularly with products which are available in print and tape, and will soon be published in microform. Information companies face the problem of getting proper compensation for "secondary information services," i.e., libraries often purchase a primary information service, but give away (to their own users) secondary services (answers to queries) which the originating company also offers, though at a charge. Probably the best protection is the fact that the product's usefulness depends upon its currency.[162]

Thus, it would appear that industry, software companies, the academic community, and the programmer are not sitting idle waiting for legislators and others to decide which method is the best legal protection for the computer program.

As I have indicated previously, Congress is presently considering a proposed general revision of the copyright law which does not refer specifically to computer programs. However, contained in this bill (S. 646 92nd Congress, 1st Sess.) is a provision for the appointment of a National

Commission on New Technological Uses of Copyrighted Works.[163] The new commission would be an adjunct of the Library of Congress as is the United States Copyright Office. The purpose of the commission would be to study and compile data on the reproduction and use of the copyrighted works of authorship (1) in automatic systems capable of storing, processing, retrieving and transferring information, and (2) by various forms of machine reproduction. Membership of the commission shall include members of the Congress as well as Presidential appointees and others.

What can members of the computer industry do until some form of legislation is passed by the Congress to provide the protection needed? I believe there are a number of things that can be done by interested programmers and others. Some might be willing to testify before the commission and present their views concerning the general category of protection as well as the scope of protection. The individual programmer could write the commission or his congressman and express his opinions, partisan as they may be, in order that the commission can obtain views of the various interests involved as well as suggestions from the broad spectrum of the industry. Others might join one or more of the computer industry's associations. These groups are representative of hardware manufacturers, software companies, publishers, government, and include members of the copyright and patent bar. They are well organized and knowledgeable as to, and vitally interested in, the divergent interests of the various segments of computer technology. I suggest you join such an association and actively support your own profession. I am certain these associations will have considerable influence on congressional committees that study methods and scope of protection in the future. One such organization is the Information Industry Association whose Executive Director for Information is located at 1025 15th Street NW, Washington, D. C. 20005. In addition, you should read the periodicals and journals published by members of the computer industry. Finally, there are seminars sponsored by universities. One of these is the Patent Resources Group of the George Washington University. Another is Computers, Communications, and the Public Interest sponsored by John Hopkins University and the Brookings Institution.

In the beginning I indicated that there would be many questions, the answers to which would not be found within these pages. Yet, I am highly persuaded that the computer program may find protection under the copyright law both present and proposed. At the same time notwithstanding the proposed revisions of the Patent Reform Act which Congress is presently considering, I believe that a computer program is patentable. However, the scope of protection thus attained, as well as other aspects of computer usage are unclear and call for clarification either by the courts or by statutory definition in the pending legislation. Finally, I believe interim Trade Secret protection pending issuance of a patent, is entirely possible.

FORM FOR REGISTRATION OF COPYRIGHTS

APPENDIX A

Page 1

FORM A

CLASS	REGISTRATION NO.
A	DO NOT WRITE HERE

Application for Registration of a Claim to Copyright
in a published book manufactured in the United States of America

Instructions: Make sure that all applicable spaces have been completed before you submit the form. The application must be **SIGNED** at line 10 and the **AFFIDAVIT** (line 11) **must be COMPLETED AND NOTARIZED.** The application should not be submitted until after the date of publication given in line 4, and should state the facts which existed on that date. For further information, see page 4.

Pages 1 and 2 should be typewritten or printed with pen and ink. Pages 3 and 4 should contain exactly the same information as pages 1 and 2, but may be carbon copies. Mail all pages of the application to the Register of Copyrights, Library of Congress, Washington, D.C. 20540, together with 2 copies of the best edition of the work and the registration fee of $6. Make your remittance payable to the Register of Copyrights.

1. Copyright Claimant(s) and Address(es): Give the name(s) and address(es) of the copyright owner(s). Ordinarily the name(s) should be the same as in the notice of copyright on the copies deposited.

Name ....

Address ....

Name ....

Address ....

2. Title: ....
(Give the title of the book as it appears on the title page)

....

3. Authors: Citizenship and domicile information must be given. Where a work was made for hire, the employer is the author. The citizenship of organizations formed under U.S. Federal or State law should be stated as U.S.A. Authors may be editors, compilers, translators, illustrators, etc., as well as authors of original text. If the copyright claim is based on new matter (see line 5) give requested information about the author of the new matter.

Name .... Citizenship ....
(Give legal name followed by pseudonym if latter appears on the copies) (Name of country)

Domiciled in U.S.A. Yes .... No .... Address ....

Name .... Citizenship ....
(Give legal name followed by pseudonym if latter appears on the copies) (Name of country)

Domiciled in U.S.A. Yes .... No .... Address ....

Name .... Citizenship ....
(Give legal name followed by pseudonym if latter appears on the copies) (Name of country)

Domiciled in U.S.A. Yes .... No .... Address ....

4. Date of Publication of This Edition: Give the complete date when copies of this particular edition were first placed on sale, sold, or publicly distributed. The date when copies were made or printed should not be confused with the date of publication. **NOTE:** The full date (month, day, and year) must be given. For further information, see page 4.

....
(Month) (Day) (Year)

➤➤ (NOTE: Leave line 5 blank unless the following instructions apply to this work.) ◀◀

5. New Matter in This Version: If any substantial part of this work has been previously published anywhere, give a brief, general statement of the nature of the new matter published for the first time in this version. New matter may consist of compilation, translation, abridgment, editorial revision, and the like, as well as additional text or pictorial matter.

....

....

➤➤ NOTE: Leave line 6 blank unless there has been a PREVIOUS FOREIGN EDITION in the English language. ◀◀

6. Book in English Previously Manufactured and Published Abroad: If all or a substantial part of the text of this edition was previously manufactured and published abroad in the English language, complete the following spaces:

Date of first publication of foreign edition ....
(Year)

Was registration for the foreign edition made in the U.S. Copyright Office? Yes .... No ....

If your answer is "Yes," give registration number ....

EXAMINER

7. If registration fee is to be charged to a deposit account established in the Copyright Office, give name of account:

8. Name and address of person or organization to whom correspondence or refund, if any, should be sent:

Name .... Address ....

9. Send certificate to:

(Type or print name and address)

Name ....

Address ....
(Number and street)

....
(City) (State) (ZIP code)

10. Certification: (NOTE: Application not acceptable unless signed)

I CERTIFY that the statements made by me in this application are correct to the best of my knowledge.

....
(Signature of copyright claimant or duly authorized agent)

11. Affidavit (required by law.) Instructions: (1) Fill in the blank spaces with special attention to those marked **"(X)."** (2) Sign the affidavit before an officer authorized to administer oaths within the United States, such as a notary public. (3) Have the officer sign and seal the affidavit and fill in the date of execution.

NOTE: The affidavit must be signed and notarized only *on or after* the date of publication or completion of printing which it states. The affidavit *must* be signed by an individual.

STATE OF .... } *ss:*

COUNTY OF .... }

I, the undersigned, depose and say that I am the

☐ Person claiming copyright in the book described in this application;

☐ Duly authorized agent of the person or organization claiming copyright in the book described in this application;

☐ Printer of the book described in this application.

That the book was published or the printing was completed on: **(X)** ....
(Give month, day, and year)

That, of the various processes employed in the production of the copies deposited, the setting of the type was performed within the limits of the United States or the making of the plates was performed within the limits of the United States from type set therein; or the lithographic or photoengraving processes used in producing the text were wholly performed within the limits of the United States, and that the printing of the text and the binding (if any) were also performed within the limits of the United States. That such typesetting, platemaking, lithographic or photoengraving process, printing, and binding were performed by the following establishments or individuals at the following addresses:

(GIVE THE NAMES AND ADDRESSES OF THE PERSONS OR ORGANIZATIONS WHO PERFORMED SUCH TYPESETTING OR PLATEMAKING OR LITHOGRAPHIC PROCESS OR PHOTOENGRAVING PROCESS OR PRINTING AND BINDING, ETC.)

Names **(X)** .... Addresses **(X)** ....

....

....
(Signature of affiant)

(Sign and notarize only on or after date given above)

PLACE
NOTARIAL SEAL
HERE

Subscribed and sworn to / affirmed before me this ....

day of ...., 19......

....
(Signature of notary)

FOR COPYRIGHT OFFICE USE ONLY

Application and affidavit received

Two copies received

Fee received

Renewal

155

☆ U.S. GOVERNMENT PRINTING OFFICE : 1970 O—380-872

Page 3

Certificate
Registration of a Claim to Copyright
in a published book manufactured in the United States of America

FORM A

CLASS	REGISTRATION NO.
A	DO NOT WRITE HERE

This Is To Certify that the statements set forth on this certificate have been made a part of the records of the Copyright Office. In witness whereof the seal of the Copyright Office is hereto affixed.

Register of Copyrights
United States of America

1. Copyright Claimant(s) and Address(es):

Name ....

Address ....

Name ....

Address ....

2. Title: .... (Title of book)

....

3. Authors:

Name .... (Legal name followed by pseudonym if latter appears on copies) Citizenship .... (Name of country)

Domiciled in U.S.A. Yes .... No .... Address ....

Name .... (Legal name followed by pseudonym if latter appears on copies) Citizenship .... (Name of country)

Domiciled in U.S.A. Yes .... No .... Address ....

Name .... (Legal name followed by pseudonym if latter appears on copies) Citizenship .... (Name of country)

Domiciled in U.S.A. Yes .... No .... Address ....

4. Date of Publication of This Edition:

.... (Month) (Day) (Year)

5. New Matter in This Version:

....

....

6. Book in English Previously Manufactured and Published Abroad: If all or a substantial part of the text of this edition was previously manufactured and published abroad in the English language, complete the following spaces:

Date of first publication of foreign edition .... (Year)

Was registration for the foreign edition made in the U.S. Copyright Office? Yes .... No ....

If your answer is "Yes," give registration number ....

EXAMINER

7. Deposit account:

8. Send correspondence to:

Name .... Address ....

9. Send certificate to:

(Type or print name and address)

Name ....

Address ....
(Number and street)

....
(City) (State) (ZIP code)

Information concerning copyright in books

When to Use Form A. Form A is appropriate for published books which have been manufactured in the United States.

What Is a "Book"? The term "books" covers not only material published in book form, but also pamphlets, leaflets, cards, and single pages containing text. Books include fiction, nonfiction, poetry, collections, directories, catalogs, and information in tabular form.

Unpublished Books. The law does not provide for registration of "book" material in unpublished form. Unpublished books are protected at common law against unauthorized use prior to publication.

Duration of Copyright. Statutory copyright in published books lasts for 28 years from the date of first publication, and may be renewed for a second 28-year term.

How to secure statutory copyright in a book

First: Produce Copies With Copyright Notice. Produce the work in copies by printing or other means of reproduction. To secure copyright, it is essential that the copies bear a copyright notice in the required form and position, as explained below.

Second: Publish the Work With Copyright Notice. The copyright law defines the "date of publication" as ". . . the earliest date when copies of the first authorized edition were placed on sale, sold, or publicly distributed by the proprietor of the copyright or under his authority. . . ."

Third: Register Your Copyright Claim. Promptly after publication, mail to the Register of Copyrights, Library of Congress, Washington, D.C. 20540, two copies of the work as published with notice, an application on Form A, properly completed and notarized, and a fee of $6.

The Copyright Notice. The copyright notice for books shall appear on the title page or verso thereof, and shall consist of three elements: the word "Copyright," or the abbreviation "Copr.," or the symbol ©, accompanied by the name of the copyright owner and the year date of publication. Example: © John Doe 1970. Use of the symbol © may result in securing copyright in countries which are members of the Universal Copyright Convention.

NOTE: It is the act of publication with notice that actually secures copyright protection. If copies are published without the required notice, the right to secure copyright is lost, and cannot be restored.

Books manufactured abroad

In General. Form A is not appropriate for books which have been manufactured outside the United States.

Foreign-Language Books. Applications covering foreign-language books by foreign authors, manufactured abroad, should be submitted on Form A–B Foreign.

English-Language Books. Books in English manufactured abroad may be registered for "ad interim" copyright (Form A–B Ad Interim); or, if they are protected under the Universal Copyright Convention they are eligible for full-term registration on Form A–B Foreign:

(1) *Ad Interim Copyright.* Ad interim registration is necessary for protection in the United States unless copyright has been secured under the Universal Copyright Convention. To secure ad interim copyright a claim must be registered within 6 months of first publication abroad. Ad interim copyright lasts for 5 years or until an American edition is published within the 5-year period and registered.

(2) *Universal Copyright Convention.* An English-language work by a foreign author first published abroad is eligible for full-term U.S. copyright if: (a) its author is a citizen or subject of a country which is a member of the Universal Copyright Convention, or the work was first published in such country, and (b) all published copies bear the copyright notice provided under the Universal Copyright Convention.

FOR COPYRIGHT OFFICE USE ONLY

Application and affidavit received	
Two copies received	
Fee received	

☆ U.S. GOVERNMENT PRINTING OFFICE : 1970 O—380-872

FORM BB

CLASS
B
REGISTRATION NO.
DO NOT WRITE HERE

Application for Registration of a Claim to Copyright

in a contribution to a periodical manufactured in the United States of America

Instructions: Make sure that all applicable spaces have been completed before you submit the form. The application must be *signed* at line 10. The application should not be submitted until after the date of publication given in line 4 (a), and should state the facts which existed on that date. For further information, see page 4.

Pages 1 and 2 should be typewritten or printed with pen and ink. Pages 3 and 4 should contain exactly the same information as pages 1 and 2, but may be carbon copies.

Mail all pages of the application to the Register of Copyrights, Library of Congress, Washington 25, D. C., together with one complete copy of the periodical containing the contribution and the registration fee of $4. Make your remittance payable to the Register of Copyrights.

1. Copyright Claimant(s) and Address(es): Give the name(s) and address(es) of the copyright owner(s). Ordinarily the name(s) should be the same as in the notice of copyright on the copy of the contribution deposited.

Name

Address

Name

Address

2. Title:
(Give the title of the contribution as it appears on the copies)

3. Authors: Citizenship and domicile information must be given. Where a work is made for hire, the employer is the author. The citizenship of organizations formed under U. S. Federal or State law should be stated as U. S. A.

Authors may be editors, translators, illustrators, etc., as well as authors of original text. If the copyright claim is based on new matter (see line 5), give information about the author of the new matter.

Name (Give legal name followed by pseudonym if latter appears on the copies) Citizenship (Name of country)

Domiciled in U. S. A. Yes ☐ No ☐ Address

Name (Give legal name followed by pseudonym if latter appears on the copies) Citizenship (Name of country)

Domiciled in U. S. A. Yes ☐ No ☐ Address

4. Publication:

(a) Date of Publication: Give the date when copies of the periodical containing this contribution were first placed on sale, sold, or publicly distributed. (NOTE: The full date (month, day, and year) must be given.)

(b) Place of Publication: Give the name of the country in which the periodical containing this contribution was first published.

(c) Published In:
(Title of periodical)

Vol. No. Date on copies Page

(NOTE: Leave all spaces in lines 5 and 6 blank unless the instructions apply to your work.)

5. New Matter in This Version: If any substantial part of this work has been previously published, in the United States or elsewhere, give a brief, general statement of the nature of the new matter in this version. New matter may consist of translation, abridgment, editorial revision, and the like, as well as additional text or pictorial matter.

6. U. S. Edition of Work in English First Manufactured and Published Abroad: If this is the U. S. edition of a work in English, and all or a substantial part of the English text of an earlier foreign edition was manufactured and first published abroad, complete the following spaces. *For further information, write to the Copyright Office.*

Date of first publication of foreign edition (Give year)

Was claim to ad interim copyright registered in the foreign edition? Yes ☐ No ☐

If claim to ad interim copyright was *not* registered, is United States copyright in the foreign edition claimed by virtue of the Universal Copyright Convention? Yes ☐ No ☐

Complete all applicable spaces on next page

7. If registration fee is to be charged to a deposit account established in the Copyright Office, give name of account:

----

8. Name and address of person or organization to whom correspondence or refund, if any, should be sent:

Name -- Address --

9. Send certificate to:

(Type or print name and address)

Name --

Address --
(Number and street)

(City) (Zone) (State)

10. Certification: (NOTE: Application not acceptable unless signed)

I CERTIFY that the statements made by me in this application are correct to the best of my knowledge.

☞ --
(Signature of copyright claimant or duly authorized agent)

Application Forms

Copies of the following forms will be supplied by the Copyright Office without charge upon request.

Class A	Form A—Published book manufactured in the United States of America.
Class A or B	Form A-B Foreign—Book or periodical manufactured outside the United States of America (except works subject to the ad interim provisions of the copyright law). Form A-B Ad Interim—Book or periodical in the English language manufactured and first published outside the United States of America.
Class B	Form B—Periodical manufactured in the United States of America. Form BB—Contribution to a periodical manufactured in the United States of America.
Class C	Form C—Lecture or similar production prepared for oral delivery.
Class D	Form D—Dramatic or dramatico-musical composition.
Class E	Form E—Musical composition the author of which is a citizen or domiciliary of the United States of America or which was first published in the United States of America. Form E Foreign—Musical composition the author of which is not a citizen or domiciliary of the United States of America and which was not first published in the United States of America.
Class F	Form F—Map.
Class G	Form G—Work of art or a model or design for a work of art.
Class H	Form H—Reproduction of a work of art.
Class I	Form I—Drawing or plastic work of a scientific or technical character.
Class J	Form J—Photograph.
Class K	Form K—Print or pictorial illustration. Form KK—Print or label used for an article of merchandise.
Class L or M	Form L-M—Motion Picture.
	Form R—Renewal copyright.
	Form U—Notice of use of copyrighted music on mechanical instruments.

FOR COPYRIGHT OFFICE USE ONLY

Application received	
Copy received	
Fee received	
Renewal	

U.S. GOVERNMENT PRINTING OFFICE : 1960 O—540106

Certificate

Registration of a Claim to Copyright

in a contribution to a periodical manufactured in the United States of America

FORM BB

CLASS B	REGISTRATION NO. DO NOT WRITE HERE

This Is To Certify that the statements set forth on this certificate have been made a part of the records of the Copyright Office. In witness whereof the seal of the Copyright Office is hereto affixed.

Register of Copyrights
United States of America

1. Copyright Claimant(s) and Address(es):

Name ____________________

Address ____________________

Name ____________________

Address ____________________

2. Title: ____________________
(Title of contribution)

3. Authors:

Name ____________________ (Legal name followed by pseudonym if latter appears on the copies) Citizenship ____________ (Name of country)

Domiciled in U. S. A. Yes ☐ No ☐ Address ____________________

Name ____________________ (Legal name followed by pseudonym if latter appears on the copies) Citizenship ____________ (Name of country)

Domiciled in U. S. A. Yes ☐ No ☐ Address ____________________

4. Publication:

(a) Date of Publication:

____

(b) Place of Publication:

____
(Name of country)

(c) Published in: ____________________
(Title of periodical)

Vol. __________ No. __________ Date on copies ____________________ Page __________

5. New Matter in This Version:

____

____

6. U. S. Edition of Work in English First Manufactured and Published Abroad: If this is the U. S. edition of a work in English, and all or a substantial part of the English text of an earlier foreign edition was manufactured and first published abroad, complete the following spaces.

Date of first publication of foreign edition __________ (Year)

Was claim to ad interim copyright registered in the foreign edition? Yes ☐ No ☐

If claim to ad interim copyright was *not* registered, is United States copyright in the foreign edition claimed by virtue of the Universal Copyright Convention? Yes ☐ No ☐

160

Complete all applicable spaces on next page

7. Deposit account:

8. Send correspondence to:

Name .... Address ....

9. Send certificate to:

(Type or print name and address)

Name ....

Address ....
(Number and street)

....
(City) (Zone) (State)

Information concerning copyright in contributions to periodicals

When To Use Form BB. Form BB is appropriate for contributions published in periodicals which have been manufactured in the U. S. A.

What Is a "Contribution to a Periodical"? The term "contribution to a periodical" refers to an article, story, illustration, or other work which is first published in a periodical; a "periodical" is a magazine, newspaper, or similar work published at regular intervals of less than a year under the same general title.

—Advertisements. Merchandise advertisements published in newspapers and magazines are not regarded as "contributions to periodicals." Applications covering such works should be submitted on Form KK as "commercial prints."

—Serial Installments. Where a work is published serially in a periodical, each installment is regarded as a separate contribution subject to separate copyright registration.

Unpublished Works. A work cannot be registered for copyright as a "contribution to a periodical" in unpublished form. Unpublished works are protected at common law against unauthorized use prior to publication.

Duration of Copyright. Statutory copyright in a published contribution lasts for 28 years from the date of first publication, and may be renewed for a second 28-year term.

How to secure statutory copyright in contributions to periodicals

First: Add a Separate Copyright Notice to the Contribution. Make sure that all copies of the contribution, as it is to appear in the periodical, contain a separate copyright notice in the form and position explained below.

Second: Await Publication of the Issue Containing Your Contribution. The copyright law defines the "date of publication" as ". . . the earliest date when copies . . . were placed on sale, sold, or publicly distributed."

Third: Register Your Copyright Claim. Promptly after publication, mail to the Register of Copyrights, Library of Congress, Washington 25, D. C., one complete copy of the issue containing your contribution, an application on Form BB, properly completed and signed, and a fee of $4.

The Copyright Notice. The copyright notice for a contribution to a periodical shall appear either on the contribution itself or in direct conjunction with it; in most cases a notice on the first page of the contribution would satisfy the requirements. For literary, dramatic, and musical contributions the notice shall consist of the word "Copyright," the abbreviation "Copr.," or the symbol ©, accompanied by the name of the copyright owner and the year date of publication. Example: © John Doe 1958.

For works which are predominantly artistic, graphic, or pictorial, the notice may consist of the symbol © with the name, initials, or other mark of the owner; if the name is not used in the notice, it must appear elsewhere on the contribution. Use of a notice consisting of the symbol © with the name and year date may result in securing copyright in countries which are parties to the Universal Copyright Convention.

NOTE: Unless the contribution is published with its own copyright notice, separate copyright registration for the contribution cannot be made.

FOR COPYRIGHT OFFICE USE ONLY	
Application received	
Copy received	
Fee received	

U.S. GOVERNMENT PRINTING OFFICE : 1960 O—540108

(Feb. 1960—35,000)

FORM OF APPLICATION FOR PATENT-- SPECIFICATION, SAMPLE CLAIMS BASED UPON A REPRESENTATIVE PROGRAM

APPENDIX B

TO THE COMMISSIONER OF PATENTS:

Your petitioner,   , a citizen of the United States and a resident of Colorado Springs, State of Colorado, whose post office address is   , prays that letters patent may be granted to him for the invention of a   , set forth in the following specification.

ABSTRACT OF DISCLOSURE

X X X

I claim:

X X X

, the above-named petitioner, being sworn, deposes and says that he is a citizen of the United States and a resident of Colorado Springs, State of Colorado, and he verily believes himself to be the original, first and sole inventor of the invention of a described and claimed in the foregoing specification; that he does not know and does not believe the same was ever known or used before his invention thereof, or patented or described in any printed publication in any country before his invention thereof, or more than one year prior to his application, or in public use or on sale in the United States more than one year prior to this application; that said invention has not been patented in any country foreign to the United States on an application filed by him or his legal representatives or assigns more than twelve months prior to this application; and that no application for patent on said invention has been filed by him or his representatives or assigns in any country foreign to the United States, except as follows: none.

Specification:

A representative program, modified in accordance with the invention, is given in the table.

TABLE: Data Processing Program

			Data Processing Instruction	
Step of Program	Step of Subset	Address of Instruction	Prefix or Command	Suffix or Data Address
1	1-A	300,000	MX	14,000
2	2-A	300,001	MY	14,001
3	3-A	300,002	XM	14,002
4		300,003	ENT	315,000
5	4-A	300,004	YM	14,003
6		300,005	MZ	14,004
	1-T	315,000	MZ	14,005
	2-T	315,001	ZM	14,006

The program is applicable to an overlap system requiring three operating cycles for each final execution of an instruction. For such a system the delay between the addressing of the transfer instruction and the time of addressing a new subset of instructions is two cycles, or N - 2. Therefore, N-1 - 1 and the special transfer instruction ENT of program step 4 is inserted before the last instruction YM of the subset constituted of steps 1-A through 4-A.

Such a program is of use where items of information previously entered into the Data Store are to be repositioned at other Data Store locations, which are associated with a particular subset forming a part of the program. A repositioning of this character makes it possible to simplify the structure of the processing equipment since the subset can then be designed to operate upon a restricted section of the Program Store.

The designation of each command is chosen to give an indication of the data processing operation directed by it. Thus, the designation MX indicates that data from the Data Store, or memory, are to be entered into the X Register; conversely, XM concerns the placing of X Register data in the Data Store. Since, in a three-cyle system, the transfer instruction provided by the invention allows the execution of the final instruction in a subset from which a transfer is to be made, its designation ENT is an abbreviation for "Execute Next (Instruction and then) Transfer."

Each step of the program contains the address of an instruction in the Program Store, as well as the instruction. For example, step 1 of the program contains the address 300,000 of the instruction MX14,000. The latter, in turn, consists of a prefix or command portion MX and a suffix or address portion 14,000 giving the location in the Data Store of data subject to the command. It is to be noted that all of the commands set forth in the Table involve transmission only to or from the Data Store. In general, the execution of certain commands may not involve the Data Store, in which case the commands are unaccompanied by data address portions.

Ordinarily, the instruction set forth in the Table would be included somewhere in the midst of a program. For simplicity, it will be assumed that the first instruction of the Table is associated with the first step of the program. Then, for the first cycle of operation, the program address at the output of the Program Address Register PAR is 300,000, as dictated by step 1 of the program. During this cycle, the Program Address Gate PAG is operated to ready the instruction MX14,000 at program address 300,000 for transmission to the Preliminary Register PR. For the initiating cycle there are no other program actions by the processing system. Typically, other program actions, as will be seen for subsequent cycles, take place concurrently with the addressing of the Program Store.

During the second cycle (step 2), the program address at the output of the Program Address Register is incremented by the action of the Increment Circuit, making the program address 300,001.

Simultaneously, instruction MX14, 000 enters the Preliminary Register as a result of the operation of the Program Register Gate PRG. Subsequently, during this cycle, the suffix portion 14, 000 of the instruction in the Preliminary Register is made available to the Data Address Register through an Address Register Gate ARG. Ordinarily, the address in the Data Address Register, is preceded by a so-called index adder which modifies the suffix portion of an instruction. Such an index adder has been omitted since its inclusion would add complexity to the system without contributing to an explanation of the invention. While the suffix portion 14, 000 of the instruction is entering the Data Address Register, the Preliminary Decoder responds to the prefix portion MX of the instruction and operates a Data Address Gate DAG, making the data address available to the Data Store.

During the third cycle (step 3), the program address advances to 300, 002. At the same time, the prefix MX enters the Final Register by the operation of a Final Register Gate FRG. While the prefix MX is in the Final Register, the Final Decoder FID operates accordingly. Since the prefix MX indicates that data are to be "read" from the Data Store DS and sent to the X Register, the Final Decoder operates the Data Reading Gate DRG, the Buffer Register Output Gate BOG, and the X Register Input Gate XIG. As a result, there is a through path for the data from the Data Store to the X Register by way of the Buffer

Data Register. In the meantime, the instruction MY14, 001 enters the Preliminary Register.

Similar operations to those described above, except for operation of the Data Writing Gate DWG during "writing" for prefix YM, take place during the ensuing cycles. During the fifth cycle (step 5) the instruction XM14, 002 enters the Final Register and is executed in the manner previously described. Simultaneously the transfer instruction ENT 315, 000 arrives at the Preliminary Register. Unlike the other instructions, the address of the transfer instruction is not destined for the Data Store. Instead of operating either the Data Address Gate or the Increment Circuit Gate, the code associated with the transfer instruction acts upon the Transfer Address Gate TAG, causing the Transfer Address to substitute for the Program Address 300, 005 that would otherwise appear at the output of the Program Address Register. Since the Increment Circuit does not operate, the Increment Circuit is prevented from interfering with the Transfer Address in the Program Address Register.

During the sixth cycle (step 6) the instruction YM14, 003 enters the Preliminary Register and the transfer instruction advances to the Final Register, and the Program Store is addressed at location 315, 000, so that on the seventh cycle the instruction entering the Preliminary Register is not that of program step 8 or instruction MZ14, 004, but is instruction MZ14, 005. The latter is the first instruction of a transferee subset and is not associated with a numbered step of the program since it ordinarily appears with a step of the program preceding that from which the transfer has been made.

Thus, the transfer is made without the loss of the operating time associated with the entry of the undesired instruction MZ14, 004 into the Preliminary Instruction Register, as is normally the case where processing takes place on an overlap basis. Upon completed execution of the instructions in the transferee subset, a transfer can be effected to another transferee subset, or to step seven of the main program, using an intermediate transfer instruction similar to that included with the subset 1-A through 4-A.

The method of processing data under the control of instructions in a data processing system, which comprises the steps of

(1) sequentially processing the instructions of a sequence of instructions, including an instruction for transferring to a non-sequential instruction of said machine,

(2) executing a further instruction of said sequence, and

(3) completing said transfer and executing said non-sequential instruction.

Sample Claims:

Cyclically operating data processing apparatus comprising means for storing first and second subsets of instruction signals, the members of the first subset including transfer instruction signals, means for initiating, at substantially the beginning of each data processing cycle, the extraction of instruction signals from the storing means, a first register and a second register, first means for gating instruction signals, extracted from said storing means, to the first of the registers at substantially the beginning of each data processing cycle, second means for gating transfer instruction signals, extracted from said storing means, from said first register to said second register after the operation of the first-mentioned gating means, and third means for gating said transfer instruction signals from said second register to the initiating means at the time the last member of said first subset is being extracted from said storing means, whereby a transfer instruction preceding the last instruction of said first subset initiates the extraction of instruction signals of said second subset immediately following the extraction of the last instruction signals of said first subset.

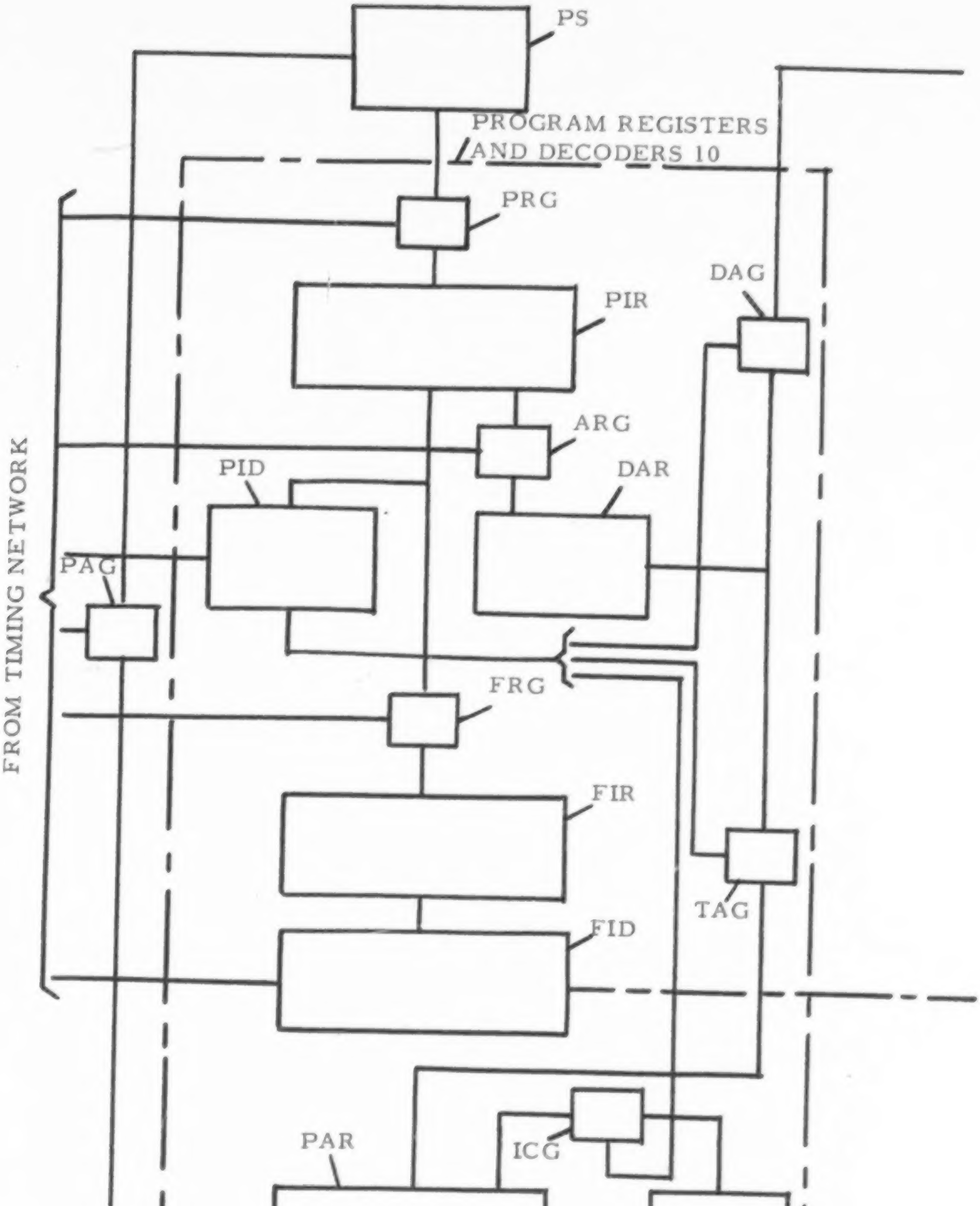
PS
PROGRAM REGISTERS AND DECODERS 10
PRG
DAG
PIR
ARG
PID
DAR
FROM TIMING NETWORK
PAG
FRG
FIR
TAG
FID
PAR
ICG
IC

FIGURE 1A

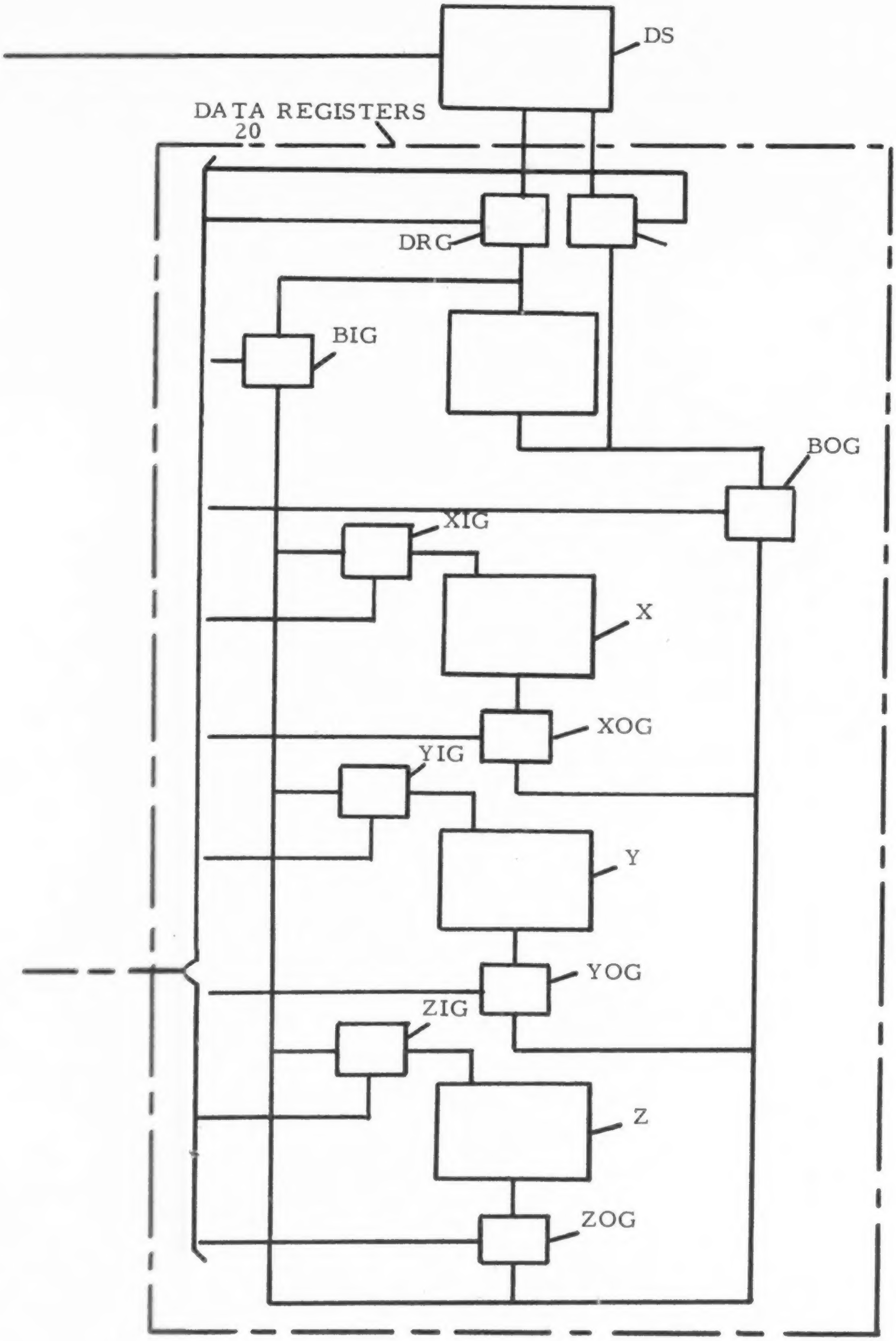
DS
DATA REGISTERS
20
DRG
BIG
BOG
XIG
X
XOG
YIG
Y
YOG
ZIG
Z
ZOG

FIGURE 1B

SUGGESTED CONFIDENTIAL CLAUSE FOR EMPLOYMENT OF NON-PROGRAMMER AND A PROGRAMMER

APPENDIX C

CLAUSE FOR EMPLOYMENT OF NON-PROGRAMMER

(1)

Whereas, Employer is a corporation involved in the formulation, development, embodiment, coding and use of computer programs; and

Whereas, Non-Programmer desires employment in Employer corporation in a capacity wherein he will come into contact, in the course of his employment, with programs and program-associated materials of great cost to Employer;

Employer and Non-Programmer agree:

1. The relationship between Employer and Non-Programmer is one of confidence and trust.
2. The following programs (including modifications thereof), as well as materials associated with them are confidential: (list programs). From time to time, Non-Programmer may be informed orally of additions to this list; such additions shall be deeded to be on the above list.
3. Non-Programmer shall not disclose any matter deemed confidential in paragraph (2), so long as the latter in question is not generally known. This restriction shall apply during and after the employment relationship.
4. Either party shall have the right upon two weeks notice, to terminate the employment relationship.
5. Non-Programmer shall not remove any tangible confidential material from Employer's premises.

CLAUSE FOR EMPLOYMENT OF PROGRAMMER

(2)

Whereas, Employer is a corporation involved in the formulation, development, embodiment, coding and use of computer programs; and

Whereas, Programmer is possessed of highly skilled technical abilities, knowledge and experience in one or more of the above areas; and

Whereas, Programmer desires employment in Employer corporation;

Employer and Programmer agree:

1. The relationship between Employer and Programmer is one of confidence and trust.
2. As used herein, "subject matter" shall denote programs, algorithms, programmable processes, processes of which a program constitutes a part, and other procedures possessing both concreteness and detail. It is contemplated that Programmer, in the course of his employment, and the products thereby created, tangible and intangible, whether solely by Programmer or by Programmer in conjunction with others, shall be owned by Employer. Three classes of subject matter are confidential: (1) subject matter actually listed below: (List); (2) modifications of the subject matter actually listed above; and (3) additional subject matter included in any of the above three classes. All list subject matter, as well as representations thereof and documentation thereto, whether or not Programmer participated

in their individual creation, development, embodiment, coding or use, and regardless of whether such subject matter existed at the time of execution of this agreement, shall be considered confidential.

3. Programmer shall not disclose any information deemed confidential in paragraph (2) above, so long as the matter in question is not generally known. This restriction shall apply during and after the employment relationship. Upon termination, Programmer shall refrain, for a period of three (3) months, from participating in the formulation, development, embodiment, coding and use of any program which effects substantially the same results as programs listed in paragraph (2), including oral additions.

4. Either party shall have the right, upon two weeks notice, to terminate the employment relationship.

5. Programmer shall execute any papers which Employer requests for the purpose of granting Employer proprietary rights in any programs or program-associated materials.

6. Programmer acknowledges that he is not bringing to Employer any subject matter, representation thereof, or documentation thereto, which is substantially similar to any listed subject matter.

7. Programmer shall not remove any tangible confidential material from Employer's premises.

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APPENDIX D

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111. 28 U.S.C. §1498(b); e.g., Executive Order No. 11222, 8 May 1965, DOD Directive 5500.7, 22 March 1966; paragraph 7, 15, AFR 30-30, 1966, Section C, AFR 110-8, 1970.

112. Carnahan, Copyright or Wrong, 12 USAF JAG L. Rev. 1 (Winter, 1970), at 19.

113. 284 F. 2d 262, 265, 269 (D.C. Cir. 1960). *Vacated and remanded on other grounds*, 369 U.S. 111, 7 L. Ed. 2d 604.

114. 46 F. Supp. 471, 473 (D.S.N.Y. 1942).

115. Cf. *United States v. First Trust Co. of St. Paul*, 215 F. 2d 686 (8th Cir. 1958). Rough notes made by Capt Clark (Lewis and Clark expedition) were private as opposed to official records.

116. 57 Washington Law Rev. 286, 290 (1929); cf. *Sherr v. Universal Match Corp.*, 417 F. 2d 497 (2d Cir. Oct. 15, 1969) *aff'g*, 297 F. Supp. 107 (S.D.N.Y. 1967, in which the Court of Appeals held that works created by military personnel as a part of their duties came within the provisions of 17 U.S.C. §26 ("author" defined to include employer in case of works made for hire), though it is somewhat of a strain to classify the relationship between the government and its military personnel as one of employment voluntarily entered into.

117. Ibid.

118. And a similar rule would apply to AFIT dissertations and works prepared during Sabbatical.

119. Note 111, supra.

REFERENCES

120. 11 Bull. CR. SOC. 361 (1964).

121. Note 7, supra, at 364.

122. Reiss v. National Quotation Bureau, Inc., 276 Fed. 717 (S. D. N. Y. 1921).

123. Computer programs on magnetic tapes were similarly accepted for Registration by the Copyright Office, note 7, supra, at 365. However, the Copyright Office requires a deposit of one printout for each tape as a visually perceived component and this component may be the only copyrightable element; see also Kaminstein "Copyright Developments," 12 Bull. CR. SOC. at 3, 4 (1964).

124. See Keziah, "Copyright Registration for Aleatory and Indeterminate Musical Compositions," 17 Bull. CR. SOC. 311 (June 1970); also piracy of sound recording by tapes of electronic transcription has been held to constitute unfair competition and infringement of common law copyright in the state courts, Columbia Broadcasting System v. Spies, d/b/a Tape-A-Tape Tape Sound Reproduction Co., 167 U. S. P. Q. 492 (Ill. Cir. Ct. 1970); more recently Congress has passed legislation to permit copyright protection for sound recordings provided that they are fixed and first published with the statutory copyright notice on or after February 15, 1972. A sound recording is a work that results from the fixation of a series of musical, spoken or other sounds, e. g., phonograph discs, open reel tapes, cassettes and cartridges, P. L. 92-140, Oct 1971; see also Brylawski, Copyrightability of Motion Picture Sound Tracks, 18 Bull. CR. SOC. 357, Item 301 (1971); in contrast the first video tape was accepted for registration by the Copyright Office on 19 April 1961, 8 Bull. CR. SOC. 206 (1961); in addition, video tapes have been protected from infringement by the courts, Walt Disney Productions v. Alaska Television Network, Inc., 310 F. Supp. 1073 (1969).

125. 17 U. S. C. §26.

126. Nimmer, Copyright Publication, 56 Columbia L. Rev. 185 (1956).

127. Baker v. Selden, note 48, supra; see also Taylor Instruments Co. v. Fawley-Brost Co., 137 F. 2d 98 (7th Cir. 1943).

128. However, see McGovern, Competition, note 72, *supra*; Doud, The Business of Software and Its Protection, 1969 Computer-in-Law Institute, note 72, supra; Goetz, Future Direction of the Software Industry, Ibid; Head & Linick, Software Package Acquisition, 14 Datamation 22 (Oct, 1968), "ADR to Sell 1000th AUTOFLOW, 3 Computer World 41, (Dec, 1969).

129. *Makay v. Benjamin Franklin Realty and Holding Co.*, 288 Pa. 207, 135 Atl. 613 (1927).

130. *Desilva Construction Corp. v. Herrald*, 213 F. Supp. 184 (1962).

131. Note 48, *supra*. The general prohibition that has been read into *Baker v. Selden* against copyright of systems programs has been followed in other decisions, *Briggs v. New Hampshire Trotting and Breeding Assn., Inc.*, 191 F. Supp. 234 (D.N.H. 1960).

132. *Brief English Systems, Inc. v. Owens et al.*, 48 F. 2d 555 (2d Cir. 1931).

133. New Technology and the Law of Copyright: Reprography and Computers, 15 U.C.L.A. L. Rev. 931, 1004 (1968); The major difficulty arises from the fact that the statements of programs can be so easily altered without changing their function or their efficacy - see Note, Computer Programs and Proposed Revisions of the Patent and Copyright Laws, 81 Harvard L. Rev., note 76, *supra*.

134. *White-Smith Music Pub. Co. v. Appollo Co.*, 209 U.S. 18-20 (1908), *Kalem Co. v. Harper Bros.*, 222 U.S. 55 (1911).

135. Although the copyright statute speaks of the "exclusive rights" of a copyright holder, some copying of copyrighted works is permitted. For example, book reviewers may quote brief passages from copyrighted works in their criticisms, and newspapers often contain brief synopses of operas and plays. Although such uses would appear to infringe on the "exclusive rights" of a copyright holder, the courts have found no infringement because the uses have been "fair." Thus, the rights of a copyright owner are not quite "exclusive." Under the judicial doctrine of "fair use," some copying of a copyrighted work is permissible provided the copying is reasonable and the rights of the Owner are not materially imapired (*Consumer's Union of the United States v. Hobart Mfg. Co.*, 189 F. Supp. 275 (S.D.N.Y. 1960). There are two bases for the doctrine of fair use: the public good in the dissemination of knowledge and the negligibility of the use. Theoretically, at least, the primary purpose for providing copyright protection is the "public good" (i.e., to encourage authorship by offering the incentive of protection). And it is also for the public good that reasonable copying of copyrighted works be allowed (Carnahan, Copyright or Wrong, note 112, *supra*, at 9). Another basis

for fair use is the doctrine of deminimis non curat lex ("the law will not concern itself with trifles"). To sustain an action for infringement of copyright, a substantial portion of the whole or a material part must be reproduced (Mathews Conveyor Co. v. Palmer-Bee Co., 135 F. 2d 73 (6th Cir. 1943). To determine what is a substantial copy or a material reproduction, the courts look to such factors as the part of the author's work taken, the part the user contributed to his own work,' the value of the author's work taken, the labor saved by using the author's work, the amount of original work added to the author's work, whether the user's work could serve as a substitute for the author's work, and interrelated factors of competition, commercial gain, loss to the copyright holder, and the number and quality of copies (Rosemont Enterprises v. Random House, Inc., 366 F. 2d 803 (2d Cir. 1966), cert. denied, 385 U.S. 1009, 17 L. Ed. 2d 546, 87 Sup. Ct. 714 (1967). Included in the proposed revision to the Copyright Act is the recommendation that Section 107 be amended to characterize fair use as generally being "for purposes such as criticism, comment, news reporting, teaching, scholarship or research." (S. 543, 91st Cong. 1st Sess. 1969) Section 107, is intended to restate the present judicial doctrine of fair use, not to change, narrow, or enlarge it in any way. Beyond a very broad statutory explanation of what fair use is and some of the criteria applicable to it, the committee believed that the courts must be free to adapt the doctrine in particular situations on a case-by-case basis. The expanded statement of the Fair Use Doctrine and amended Section 107 offer some guidance to users in determining when the principles of the doctrine apply. However, the endless variety of situations and combinations of circumstances that can arise in particular cases precludes a formulation of exact rules in the statute.

136. Report No. 83 to accompany HR 2512; Hearings before the Committee on the Judiciary, House of Representatives, (90th Cong., 1st Sess. 1967).

137. Ibid. See also The Copyright Revision Bill in Relation to Computers, 1967 Senate Hearings Pt. 2, 565, 570, 576.

138. 17 U.S.C. §1(c), 1952; For legislative history and purpose of the Act of 17 July 1952, see 1952 U.S. Code, Congressional and Administrative News, at 2307; cf. Corcoran v. Montgomery Ward Co., 121 F. 2d 572, 573, 574 (9th Cir. 1941), cert. denied, 314 U.S. 687, 86 L. Ed. 55) (1941); In light of this decision it was thought that copying a nondramatic literary work into a computer information storage system was not a violation of 17 U.S.C. §1(b) or (d).

139. Subject to the Doctrine of Fair Use, see notes 135, supra, and 141, infra.

140. It may very well constitute an infringement to use a computer to prepare an index from a computer-readable record of a literary work. For example, a telephone directory is copyrightable and a person who makes a reverse index thereof is an infringer, Leon v. Pacific Telephone and Telegraph Co., 911 F. 2d 484 (9th Cir. 1937); cf. Kipling v. G.P. Putnam's Sons, 120 Fed. 631 (2d Cir. 1903); Presumably an index along with other works generated by a computer are copyrightable; While not directly in point the most significant analyses of the problem posed were made by the District Court and the Supreme Court in Fortnightly Corp v. United Artists Television, Inc., 392 U.S. 390 (1968), reversing, United Artists Television, Inc. v. Fortnightly Corp., 225 F. Supp. 177 (S.D.N.Y. 1966) aff'd, 377 F. 2d 872 (2d Cir. 1967).

141. 17 U.S.C. §1(a); Some distinction should be made between storing for reproduction and storing for abstracting, indexing or analysis. Another possible distinguishing factor is the age of the copyrighted materials to be stored. Also important is the character of the stored material, i.e., whether an abstract, quotation or substantial reproduction is stored, or merely title, author and key words. The amount of material put into an automatic retrieval system also raises the question as to whether the Fair Use Doctrine could ever be applied to the input of such systems. The consideration of the amount of material also concerns the output and raises the additional problem of determining whether both input and output are to be judged on the same basis as far as Fair Use is concerned; see Hamann, Storage and Retrieval Systems, 1967 ABA Symposium; see Generally, Computers and Copyright, The New Technology and Revision of the Old Law, 15 Bull. CR. SOC. at 1-13, Items 1-4, 1967; see also Statement of Professor Anthony G. Oettinger, 1967 Senate Hearings, note 137, supra, Pt 2 at 581, 588; Greenbaum, Copyright and the Computer, 114 Cong. Rec. 17042 (1968). For a brief view of the British Act, see Wallace, Impact of New Technology, 18 Bull. CR. SOC. at 298-299, Item 224 (1971).

142. P.L. 90-396, 82 Stat. 339 (90th Cong 2d Sess. 1968), 15 U.S.C. §290.

143. Sec. 6(a) of the Act contains such copyright authorization, specifically carving out an exception to the prohibition of Section 8 of the Copyright Act, Title 17 U.S.C., against copyright in government publications. Such copyrighted material would also be protected under the "exceptions" clause of the Freedom of Information Act, 5 U.S.C. §552(b), DOD Directive 5400.7 (June, 1967), 32 C.F.R. 806; AFR 12-30, AFR 110-8 (1970).

144. S. Rep. 1230 (90th Cong. 2d Sess. 1968); H. Rep. 260 (90th Cong. 1st Sess. 1967).

145. H.R. 15638 (89th Cong. 2d Sess., superseded by H.R. 16897 (1966), at 73, 74-75.

146. Ibid; H.R. 260, *supra*, at 7-8.

REFERENCES

147. Hearings on Data Processing Management in Federal Government Activities, Subcomm. of the House Comm. on Govt Operations, 90th Cong., 1st Sess. 1967 at 139; Galbi, The Unpatentability of Computer Programs, note 41, *supra*; Report of the President's Commission on the Patent System, "To Promote the Progress of . . . Useful Arts" in an Age of Exploding Technology, at 12 (G.P.O. 1966); Executive Order No. 11215, 30 F.R. 4661; S. 1042 (H.R. 5924)(90th Cong., 1st Sess. 1967), Sec. 106; Guidelines to Examination of Programs, proposed at 829 Official Gazette 1, (U.S.P.O.) 2 August 1966, which riled both proponents and opponents to patenting computer programs. In 1968 the U.S. Patent Office issued a set of guidelines which bore little resemblance to the 1966 Guidelines, The 1968 Guidelines states, "A computer programming process which produces no more than a numerical, statistical or other informational result is not directed to patentable subject matter," Guidelines . . . 855 O.G. 829, 33 F.R. 15609 (1968), *Rescinded* 808 O.G. 349, 34 F.R. 15724 (1969).

148. *Don Lee Inc. v. Walker*, 61 F. 2d 58 (9th Cir. 1932); *Haliburton v. Walker*, 146 F. 2d 817 (9th Cir. 1944); *In Re Abrams*, 188 F. 2d 165 (Court of Customs & Patent Appeals, 1951); *In Re Shao Wen Yuan*, 188 F. 2d 377 (C.C.P.A. 1951), Mental Steps and Computer Programs, 52 J.P.O.S. 275 (1970).

149. *Robert Gottshalk, Acting Commissioner of Patents v. Benson and Tabbot*, No. 71-485, 4 October 1971.

150. *Benson, supra*, 44 F. 2d 682, 169 U.S.P.Q. 548 (1971), relying heavily on the decision *in re Musgrave, supra.*

151. Application of *Shao Wen Yuan*, note 192, *supra*, at 380.

152. Bender, Computer Programs: Should They Be Patentable? 68 Columbia L. Rev. 241 (1968); 56 Calif. L. Rev. 466 (1968); Computer Program Protection: The Need to Legislate a Solution, 54 Cornell L. Rev. 586 (1969).

153. Electronic News (July, 1970).

154. Guidelines were rescinded, note 147, *supra*; In a December 1969 decision the Supreme Court may have muddied the watters concerning the elusive concept of "non-obviousness," especially as applied to combination patents, *Anderson's Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 90 S. Ct. 305, 24 L. Ed. 2d 258, 163 U.S.P.Q. 673 (1969); see also Aggregation: Comment on the Black Rock Decision, 53 J.P.O.S. 292 (1971); but see Kayton, Patent Protectability of Software: Background and Current Law, 1968 Law of Software Proceedings, B-25 (Geo. Wash. Univ. 1968).

REFERENCES

155. S. 766 91st Cong. 1st Sess. 1969, S. 2756 91st Cong. 1st Sess. 1969, superseded by S. 643 92nd Cong. 1st Sess. 1971, these acts are still awaiting passage; *Sears* and *Compco* Cases, note 104, *supra*; Adelman Trade Secrets and Federal Pre-Emption. The aftermath of *Sears*, *Compco*, 47 J. Pat. Off. Soc'y. 7[illegible] (1967); *Lear v. Adkins*, 395 U.S. 653 (1969); but see *Painton & Co. v. Bourns*, 309 F. Supp. 271 (S.D.N.Y. 1970); *Edgar H. Wood Associates, Inc. v. Skene*, 347 Mass. 351, 197 N.E. 2d 886 (1964); Costner, 1 Pat. L. Rev. 585 (1969).

156. Bender, George Wash. L. Rev., note 84, *supra*; Note, 46 N.Y.U.L. Rev. 17 (1971).

157. Such a broad federal law (as the Unfair Competition Act) could be obliterated by the doctrine of *Erie R. R. v. Tomkins*, 304 U.S. 64 (1938), which held "Except in matters governed by the Federal Constitution or by Acts of Congress, the law to be applied in any case is the law of the State. And whether the law of the State shall be declared by its Legislature in a statute or by its highest court in a decision is not a matter of federal concern. There is no federal general common law. Congress had no power to declare substantive rules of common law applicable in a State whether they be local in their nature or "general," be they commercial law or a part of the law of torts. And no clause in the Constitution purports to confer such a power upon the federal courts." However, it might be reconstructed through judicial use of state unfair competition rules as evidence of the sort of conduct proscribed under 15 U.S.C. §1125(a) (1964). However, in antitrust matters the "Fed." has preempted the field, notes 104, 155, *supra*.

158. 855 O.G. 555; 17 Bull. CR. SOC. 4 (April 1970).

159. Other proposals, W. W. Burns, U.S. Patent Office, 15 July 1968; Cornell L. Rev. note 152, *supra*; Time-sharing - Breyer, 84 Harvard L. Rev. 346 (1970).

160. Note 78, *supra*; Granzier, Guarding Against Industrial Espionage Management Review, at 40, 41 (January 1964).

161. Ibid.

162. Information Industry Association's Meeting, July 1969, Publisher's Weekly, August 1969.

163. S. 646 (92nd Cong., 1st Sess. 1971), formerly S. 543 (91st Cong., 1st Sess. 1969). This act is still awaiting passage.

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Far from restricting initiative and competition in an unrestricted economy, patents and copyrights encourage creative initiative. By protecting the individual's right to compensation for his creative efforts, these concepts spur men to create improvements. English law recognized such just precepts as early as 1559 and established procedures for protecting rights of ownership in inventions and the written form of original ideas. United States jurisprudence has continued the practice.

Basically the copyright or patent procedure involves (1) creativity, (2) an application for copyright registration or patent to the appropriate government office (3) a notice on the original publication or patented process, and (4) various contractual agreements between the originator and the user of the written idea or invention. Both the creator and the user can lose financially by not adhering to these rules. If the programmer does not protect his procedures, let alone ultimate problem solving programs, others may appropriate them for a profit without compensating the programmer. On the other hand, any industry, private or public, using a computer program risks infringement of patent or copyright if the program's origin and reservations on use are not carefully screened.

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